INITIAL ENVIRONMENTAL EXAMINATION (IEE)

FOR

CLAY SOIL PRODUCTION PROJECT

MALKARO VILLAGE TRACT, KYAIKMARAW TOWNSHIP, MAWLAMYINE, MON STATE, MYANMAR

December, 2019

Disclaimer

This report has been prepared by 3rd party, E Guard Environmental Services Co., Ltd. for June Cement Industry Limited for the project of Clay Soil Production located at Near Kaw Pa Naw Village, Kyaikmaraw Township, Mon State. The report preparation was done inside the framework of Myanmar EIA Procedure 2015.

The analysis works had been done based on the provided data of the proposed plan of project Government Environmental Authority, Environmental Conservation Department, hereinafter ECD.

The impact assessment and mitigation measure are prepared based on the facts and figures of detail plan/process of the project obtained from the client.

Moreover, this report has been prepared in line with the prevailing active Laws, Rules, Procedure, Guidelines, and Standards etc. of Myanmar Legal System on (Month/Year).

The drawings, sketches, maps and other illustrative figures in this report are for the demonstrative/descriptive purposes only and not to be considered as approved boundary nor accepted territory nor recognized properties extend of any kind.

In case of dual or multiple meanings of the wordings, those wordings should be interpreted as relevant meaning to the concerned areas of discussed in this report.

The individual/personal, organizational and commercial data and information found in this report are included based on the concerned authority's requirement. The privacy and trade secrets concerned are to be addressed to the concerned authority ECD.

JUNE CEMENT INDUSTRY LTD.
No.(80), Sayarsan Lane, Bahan Township, Yangon, Myanmar.
Tel: 95-1-202743, 296754 Fax:95-1-299832

Commitment to follow Environmental Conservation Law, Rules and Regulation, Environmental Standards and Mitigation Measures Stated in the Environmental Management Plan (EMP) of IEE Reports

With regard to the above matter, we, June Cement Industry Limited has established for related projects (Jetty construction, channel construction, clay soil production and laterite production) needed for Cement plant. Our company strongly commits that all our operations will be performed in an environmentally friendly manner by following Environmental Conservation Law 2012, Environmental Conservation Rules 2014, Environmental Impact Assessment Procedure and National Environmental Quality (emission) Guidelines (2015) and relevant environmental standards through successful implementation of mitigation measures stated in the Environmental Management Plan (EMP), EMoP, CSR Plan and Grievance Redress Mechanism of IEE Reports.

Myint Soe

Managing Director

June Cement Industry Ltd;

No. (II), Airport Avenue Road, (ဓာတ်ပြိုင်ကွင်းလမ်း)
Yangon Airport Road, Saw Bwar Gyi Gone Quarter,
Insein Township, Yangon 11011, Myanmar.
Tel: (95) 1 666512 Fax: (95) 19667757
H.P (95) 9 44801676

Commitment to follow and compliance with Environmental Conservation Law, Rules, Environmental Impact Assessment Procedure, National Environmental (Quality) Emission Guidelines, Standards and Mitigation Measures Stated in the Environmental Management Plan (EMP) of IEE reports

With regard to the above matter, we, E Guard Environmental Services has prepared the Initial Environmental Examination (IEE) Reports for related projects (Jetty construction, channel construction, clay soil production and laterite production) needed for Cement plant. Our company strongly commits that this IEE report has been prepared by following Environmental Conservation Law (2012), Environmental Conservation Rules (2014), Environmental Impact Assessment Procedure (2015), National Environmental (Quality) Emission Guidelines (2015) and relevant environmental standards through successful implementation of mitigation measures and monitoring plan stated in the Environmental Management Plan (EMP) of IEE Reports.

Tin Aung Moe
Director
E guard Environmental Services

Report Review Form

Report Title: Initial Environmental Examination (IEE) Report For Clay Soil Production Project	
Report Version: Version-00	
Proponent: **June Cement Industry Limited** No.80, Sayar San Street, Bahan Township, Yangon. Tel: +9592005445/ +9519010660 Fax: +9519010080 tinoo.june@gmail.com	**Prepared by;** **E Guard Environmental Services Co., Ltd.** No. (145-A2-3), Thiri Mingalar Street, Ward No. (4), Mayangone Township, Yangon 11062, Myanmar. Tel: 01 667953, Fax: 01 6667953, info@eguardservices.com Mobile: +959 797005199
Prepared by: U Kyaw Soe Moe	**Position: Project Associate**
Submitted Date: 25 /11/2019	**Signature:**
Checked by: U Aung Myint Myat	**Position: Associate Consultant**
Checked Date: 28/11/2019	**Signature:**
Summary: IEE Report This document presents Initial Environmental Examination (IEE) report as required for clay soil production project.	**Approved by:**

Distribution:

- ☐ Internal
- ☒ Public
- ☐ Confidential

Contents

List of figures

List of Tables

Executive Summary

June Cement Industry Limited proposed to conduct the Initial Environmental Examination (IEE) report for proposed clay soil production, near Malkaro Village, Kyaikmaraw Township, Mon State. The investor submitted a project investment proposal on August 19, 2015 to the Myanmar Investment Commission (MIC) and then, for the environmental approval and comments of the Ministry of the Natural Resources and Environmental Conservation (MONREC). As per the comments of ECD, the proposed project needs to submit IEE report. Therefore, June Cement Industry Limited commissioned E Guard Environmental Services for IEE report study. The specific objectives of this study are to;

1) Identify the major impacts that may arise from the activities of the proposed project on natural environment and socio-economic environment of the project area,
2) Describe the mitigation measures to minimize these impacts,
3) Prepare and implement Environmental Management Plan for the project and
4) Make sure that IEE is developed sufficiently and soundly for the proposed project.
5) Implement Corporate Social Responsibility Plan (CSR Plan) which plays an essential part for the improvement of the social welfare of the community as well as the development of the region.

E Guard Environmental Services prepared this IEE report in accordance with EIA procedure (2015) and National Environmental Quality (Emissions) Guidelines (2015). This IEE report identifies all possible potential impacts to be caused by the construction, operation and decommissioning for the clay soil production. The proposed project background and scope of the study are described in **Chapter 1.**

The elevation of project area is 18 ft above the sea level. The intended project period will be 30 years. The purpose of the project is to provide clay soil for June Cement Production during the operational phase, to provide employment opportunities for local residents and to have good access along the road for those villagers living close to Kaw Pa Naw Village. Open cast mining method will be used for clay soil production and there will be no drilling and blasting operations due to the soft nature of clay soil. It will excavate directly from its in situ position by excavator and so no over burden dumps and no waste stockpile will be generated from the clay soil production. Major use of utilities such as water, electricity and fuel requirement, human resources, use of vehicles, amount of production and generated wastes, are also mentioned in **Chapter 2.**

The proposed project proponent is June Group Company Limited, which is a 100 % local investment. Detailed information of the project proponent and IEE experts are described in **Chapter 3 and 4**.

The brief summary of relevant national environmental legislations such as Environmental Impact Assessment Procedure (2015) and National Environmental Quality (emission) Guidelines, established by the Ministry of Natural Resources and Environmental Conservation (MONREC) and overview of current local and international environmental and social policies including related international or regional convention for the proposed project were also described in **Chapter 5.**

For environmental baseline data were collected by onsite measurements analysis for air quality and noise level at proposed project site. Surface water and soil samples were also collected and sent to respective laboratories and then the analyzed lab results can be seen in **Appendix 1 and Appendix 3**. Moreover, secondary data collection of proposed project site area such as physical/biological environment, and weather data and land use were collected from the township data of Kyaikmaraw Township, Mon State. Environmental quality baseline data collection conducted on 14th to 15th March, 2019 and detail analysis results of air quality, noise level and water quality results are described in **Chapter 6.**

The project activities during the whole project period (construction, operation and decommissioning) could have negative and positive impacts on the existing environment. The following methodology has been applied to assess the environmental impacts of the clay soil production mainly on air, water, land, biodiversity including human beings. Qualitative assessment is used and each source of impact has been assessed in the following method.

Assessment	Scale				
	1	2	3	4	5
Magnitude (M)	Insignificant	Small and have no effect on environment	Moderate and will result in minor changes on environment	High and will result in minor changes on environment	Very High and will result in permanent change on environment
Duration (D)	0-1 year	2-5 year	6-15 year	Life of operation	Post closure
Extent(E)	Limited to the site	Limited to local area	Limited to region	National	International
Probability (P)	Very improbable	Improbable	Probable	Highly probable	Definite

Then, the Significant Point (SP) is calculated by following formula.

Significant Point (SP) = (Magnitude+ Duration+ Extent) * Probability

Impact Significance: Based on calculated significant point, impact significance can be categorized as follows:

Explanation

Significant Point (SP) = (Magnitude+ Duration+ Extent) * Probability

Impact Significance

Significant Point (SP)	Impact Significance
<15	Very low
15-29	Low
30-44	Moderate
45-59	High
<60	Very High

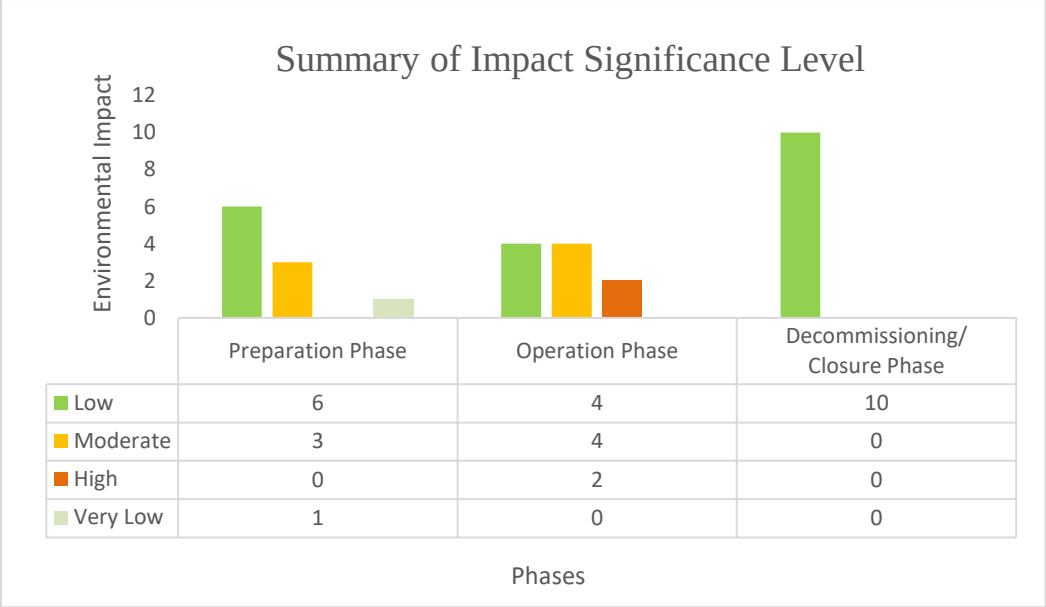


Figure-Summary of Significance of impact

According to the analysis of these results, most of the project activities are low significance and some are moderate and high significance which need to improve for environmental performance. Social and economic developments are positive impacts of the proposed project. Potential negative impacts and mitigation measures of the proposed project are described in **Chapter 7.**

Public consultation meeting was held on 15th June, 2019 at Malkaro Village, Kyaikmaraw Township, Mon State. U Tin Oo (Project manager) explained about the proposed project, type of investment and also their future plan. And then, U Tin Aung Moe (Director) also explained about the objective of IEE study, baseline data collection and prediction of environmental impact and effective impact mitigation measure and preparation of EMP plan including with Environmental Monitoring Pan and CSR plan etc. Detail comments, suggestions, questions and answers are described in **Chapter 8.**

The **Environmental Management Plan (EMP)** identifies potential environmental impacts, source of impacts, how to mitigate these impacts and residual impacts after mitigation and responsible persons for all three phases. Due to the activities of the proposed project for all phases, the environmental qualities like air, water, soil and noise, fire hazards, occupational health and safety, waste disposal can have negative impacts but for the socio-economic, it can be positive impact. And also, the mitigation measures for these negative impacts are fully mentioned in this EMP section. The **Environmental Monitoring Plan (EMOP)** identifies parameters, frequency and responsible party to monitor for air, water and noise level for all phases. The cost estimation for EMP plan will be cost about 433,850 USD. The **Corporate Social Responsibility (CSR) Plan** aims to secure social well-being of the employees and their family members, better community living and transparent and friendly relationship with neighboring communities. The **Grievance Redress Mechanism (GRM)** identifies the steps to solve complaints related with the proposed project. The **Emergency Preparedness and Response Plan** identifies how to overcome emergency cases and effectively. This EMP has, in brief, systematically explored all possible positive and negative environmental impacts of the proposed project and identified mitigation and monitoring

measures on negative impacts which can occur in all three phases. The detail information for the plans is described in **Chapter 9.**

In Conclusion, the environmental management practices, procedures and responsibilities are defined here in to get full compliance with the existing environmental policy, laws, rules and instructions of the Republic of the Union of Myanmar. All the feedbacks, desires and needs of local public recorded in public consultation meetings are also well addressed and incorporated in formulation of EMP.

အစီရင်ခံစာအကျဉ်းချုပ်

ဤကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်းအစီရင်ခံစာသည် မွန်ပြည်နယ်၊ ကျိုက်မရောမြို့နယ်၊ မယ်ကရိကျေးရွာအနီးတွင်ဆောင်ရွက်မည့် ရွှံစေးမြေတူးဖော်ရေးလုပ်ငန်းအတွက် ဇွန်ဘိလပ်မြေစက်ရုံ လီမိတက်မှ အဆိုပြုတင်ပြသော အစီရင်ခံစာဖြစ်ပါသည်။ စီမံကိန်းအဆိုပြုသူသည် ၂၀၁၅ ခုနှစ်၊ ဩဂုတ်လ (၁၉) ရက်နေ့တွင် မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှုကော်မရှင် (MIC) သို့ စီမံကိန်းရင်းနှီးမြှုပ်နှံမှု အဆိုပြုလွှာကို လျှောက်ထားခဲ့ပါသည်။ ထို့နောက်အဆိုပြုစီမံကိန်းဆိုင်ရာ လျှောက်လွှာအပေါ် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဆိုင်ရာသဘောထားမှတ်ချက်ရယူရန်အတွက် သယံဇာတနှင့်သဘာဝ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာနသို့ ဆက်လက်တင်ပြခဲ့ပြီး လမ်းညွှန်ချက်တောင်းခံခဲ့ ပါသည်။ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန၏ သဘောထားမှတ်ချက်အရ အဆိုပြုစီမံကိန်းသည် ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်း အစီရင်ခံစာတင်သွင်းရန် ညွှန်ကြားလာပါသည်။ ထို့ကြောင့် ဇွန်ဘိလပ်မြေစက်ရုံလီမိတက်သည် ရွှံစေးမြေတူးဖော်ခြင်းလုပ်ငန်းလုပ်ဆောင်နိုင်ရန်အတွက် ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်း အစီရင်ခံစာရေးဆွဲရန် အီးဂတ်ပတ်ဝန်းကျင်ဆိုင်ရာဝန်ဆောင်မှုလုပ်ငန်းကို ငှားရမ်းခဲ့ပါသည်။ ဤလေ့လာဆန်းစစ်ခြင်း၏ အဓိကရည်ရွယ်ချက်များမှာ-

- သဘာဝပတ်ဝန်းကျင်နှင့်လူမှုစီးပွားပတ်ဝန်းကျင် တို့အပေါ် စီမံကိန်းဆောင်ရွက်ချက်များ ကြောင့် ထိခိုက်မှုများကိုလေ့လာရန်။
- ထိခိုက်မှုများကို လျှော့ချနိုင်ရန် လျော့နည်းစေမည့်နည်းလမ်းများကို ဖော်ပြရန်။
- စီမံကိန်းအတွက် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်ကို ပြင်ဆင်ရန်နှင့် အကောင်အထည် ဖော်ရန်။
- စီမံကိန်းအတွက် လုံလောက်တိကျသော ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်းလုပ်ဆောင်မှု ရှိစေရန်။
- ဒေသခံများ၏လူမှုရေးရာ သက်သာချောင်ချိမှုများ တိုးတက်ရန်နှင့် ဖွံ့ဖြိုးတိုးတက်မှုများ အတွက် မရှိမဖြစ်အရေးပါသော လူမှုစီးပွားတာဝန်ယူမှုအစီအစဉ်အား အကောင်အထည်ဖော် ဆောင်ရွက်ရန်တို့ဖြစ်ပါသည်။

အီးဂတ်ပတ်ဝန်းကျင်ဆိုင်ရာဝန်ဆောင်မှုလုပ်ငန်းသည် ဤအစီရင်ခံစာကို ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာနမှ ထုတ်ပြန်ခဲ့သော ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း၊ အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်များနှင့်အညီ ဆောင်ရွက်ခဲ့ပါသည်။ ဤအစီရင်ခံစာတွင် ရွှံ့စေးမြေတူးဖော်ခြင်းလုပ်ကွက် ပြင်ဆင်ခြင်းကာလ၊ လုပ်ငန်းဆောင်ရွက်လည်ပတ်ခြင်းကာလ နှင့် လုပ်ငန်းဖျက်သိမ်းရေးကာလတို့တွင် ဖြစ်ပေါ်နိုင်ခြေ ရှိသော သက်ရောက်နိုင်မှုများအားလုံးကို ဖော်ပြထားပါသည်။ အဆိုပြုစီမံကိန်း၏ နောက်ခံသမိုင်းအကြောင်းအရာနှင့် လေ့လာမည့်နယ်ပယ် တို့ကိုလည်း အခန်း (၁) တွင်ဖော်ပြထားပါသည်။

စီမံကိန်းတည်နေရာသည် ပင်လယ်ရေမျက်နှာပြင်အထက် (၁၈) ပေ တွင်တည်ရှိပြီး ခန့်မှန်းလုပ်ငန်းဆောင်ရွက်မှုကာလမှာ နှစ် (၃၀) ဖြစ်ပါသည်။ လုပ်ငန်းဆောင်ရွက်ခြင်းရည်ရွယ်ချက်များမှာ လုပ်ငန်းလည်ပတ်စဉ်ကာလရွံ့စေးမြေထောက်ပံ့မှုပေးနိုင်ရန်၊ ဒေသခံတို့အလုပ်အကိုင်အခွင့်အလမ်း များရရှိစေရန်နှင့် ကျေးရွာတွင်းလမ်းပန်းဆက်သွယ်ရေး ဖွံ့ဖြိုးလာစေရန်တို့ဖြစ်သည်။ ရွံ့စေးမြေ ထုတ်လုပ်ခြင်းကို ဟင်းလင်းဖွင့်နည်းစဉ်ကိုအသုံးပြုဆောင်ရွက်သွားမည်ဖြစ်ကာ ရွံ့စေးမြေ၏ ပျော့ပြောင်းမှု သဘောသဘာဝကြောင့်လွန်တူးခြင်းနှင့်ယမ်းခွဲခြင်းတို့မပါဝင်ပါ။

ရွံ့စေးမြေတူးဖော်ခြင်းကိုစက်ယန္တရားများဖြင့်သာ တိုက်ရိုက်တူးဖော် ပို့ဆောင်သွားမည်ဖြစ်သော ကြောင့် စွန့်ပစ်မြေစာနှင့်မြေစာပုံထားရှိခြင်းမရှိပါ။ လုပ်ငန်းဆိုင်ရာအချက်အလက် များဖြစ်သည့် စက်ယန္တရားအသုံးပြုမှု၊ လူအင်အားပမာဏ၊ လျှပ်စစ်နှင့်လောင်စာဆီအသုံးပြုမှု၊ ရေလိုအပ်ချက်၊ ထုတ်လုပ်မှုပမာဏနှင့် ထွက်ရှိမည့် စွန့်ပစ်ပစ္စည်းတို့ကို အခန်း (၂) တွင်ဖော်ပြထားပါသည်။

စီမံကိန်းအဆိုပြုသူသည် ဇွန်အုပ်စုကုမ္ပဏီလီမိတက်ဖြစ်ပြီး ရာနှုန်းပြည့်ပြည်တွင်းရင်းနှီးမြှုပ်နှံမှု ဖြစ်သည်။ စီမံကိန်းအဆိုပြုသူနှင့် ပတ်ဝန်းကျင်ဆိုင်ရာလေ့လာမှုဆောင်ရွက်သည့်အဖွဲ့အစည်းဆိုင်ရာ အချက်အလက် တို့ကို အခန်း (၃) နှင့် (၄) တွင်အသေးစိတ်ဖော်ပြထားပါသည်။

အဆိုပြုစီမံကိန်းနှင့်ပတ်သက်ဆက်စပ်ပြီး လိုက်နာရမည့် ဥပဒေနှင့်နည်းဥပဒေများ၊ သယံဇာတ နှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာန (MONREC) မှ ထုတ်ပြန်ထားသော ပတ်ဝန်းကျင် ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာလုပ်ထုံးလုပ်နည်းများ၊ အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်များ၊ စီမံကိန်းနှင့်သက်ဆိုင်သည့်ဒေသတွင်း (သို့) အပြည်ပြည်ဆိုင်ရာ သဘာဝပတ်ဝန်းကျင်နှင့် လူမှုပတ်ဝန်းကျင်ဆိုင်ရာမူဝါဒ၊ ဆက်စပ်နေသောသဘောတူညီချက်များကို အခန်း (၅) တွင် အသေးစိတ် ဖော်ပြထားပါသည်။

စီမံကိန်းလုပ်ငန်းဆောင်ရွက်နေစဉ်ကာလအတွင်း စီမံကိန်းနေရာ၏ လက်ရှိသဘာဝပတ်ဝန်းကျင် ဆိုင်ရာ အခြေခံအချက်အလက်များဖြစ်သည့် ဆူညံမှုတိုင်းတာခြင်း၊ လေထုအရည်အသွေးတိုင်း တာခြင်းတို့ကို ကွင်းဆင်းတိုင်းတာခဲ့ပါသည်။ မြေပေါ်ရေအရည်အသွေးနှင့် မြေအရည်အသွေးနမူနာ ကောက်ယူပြီး သက်ဆိုင်ရာဓာတ်ခွဲခန်းများသို့ပို့ကာ စစ်ဆေးမှုများပြုလုပ်ပြီးရလဒ်များအား နောက်တွင်ပါရှိသည့် နောက်ဆက်တွဲ (၁၊ ၂၊ ၃) တွင်ဖော်ပြထားပါသည်။ ထို့အပြင်အဆိုပြုစီမံကိန်း တည်နေရာနှင့်သက်ဆိုင်သည့် အခြေခံအချက်လက်များ ဖြစ်သည့်လူမှုစီးပွားအခြေအနေ၊ ရူပဆိုင်ရာ အချက်အလက်၊ ဇီဝပတ်ဝန်းကျင် ဆိုင်ရာအချက်အလက်၊ ရာသီဥတုဆိုင်ရာသတင်းအချက်အလက်များစသည်တို့ကို မွန်ပြည်နယ်၊ ကျိုက်မရော မြို့နယ်မှပြဋ္ဌာန်းထားသော မြို့နယ်ဆိုင်ရာအချက်အလက်များမှစုဆောင်းထားပါသည်။ ပတ်ဝန်းကျင် အရည်အသွေးဆိုင်ရာ အချက်အလက်များကွင်းဆင်းတိုင်းတာမှုအား ၂၀၁၉ခုနှစ်၊ မတ်လ (၁၄)ရက် နှင့် (၁၅) ရက်နေ့များတွင်လုပ်ဆောင်ခဲ့ပြီး ရရှိလာသောလေအရည်အသွေးရလဒ်၊ ဆူညံမှုအတိုင်းတာမှုရလဒ်၊ မြေပေါ်ရေ အရည်အသွေး တို့၏ အသေးစိတ်အချက်အလက်များကို အခန်း (၆) တွင်ဖော်ပြထားပါသည်။

စီမံကိန်းအကောင်အထည်ဖော်သည့်ကာလများ (တည်ဆောက်ရေးကာလ၊ လုပ်ငန်းများလည်ပတ် ဆောင်ရွက်သည့်ကာလ နှင့် စီမံကိန်းဖျက်သိမ်းရေးကာလများ) တွင်ဆောင်ရွက်သောလုပ်ငန်း များကြောင့် ပတ်ဝန်းကျင်အပေါ်တွင် ကောင်းကျိုး နှင့် ဆိုးကျိုးများဖြစ်ပေါ်စေနိုင်ပါသည်။ အောက်ဖော်ပြပါ ဆန်းစစ်သည့်နည်းလမ်းတွင် လေ၊ ရေ၊ မြေ၊ လူအပါအဝင် ဇီဝမျိုးစုံမျိုးကွဲများအပေါ် ထိခိုက်မှုများကိုလေ့လာဆန်းစစ်ခြင်းဖြစ်ပါသည်။ စီမံကိန်းလုပ်ဆောင်ရာ လုပ်ငန်းစဉ်အလိုက် ပတ်ဝန်းကျင် အပေါ်သက်ရောက်နိုင်မှုများကို အောက်တွင်ဖော်ပြထားပါသည်။

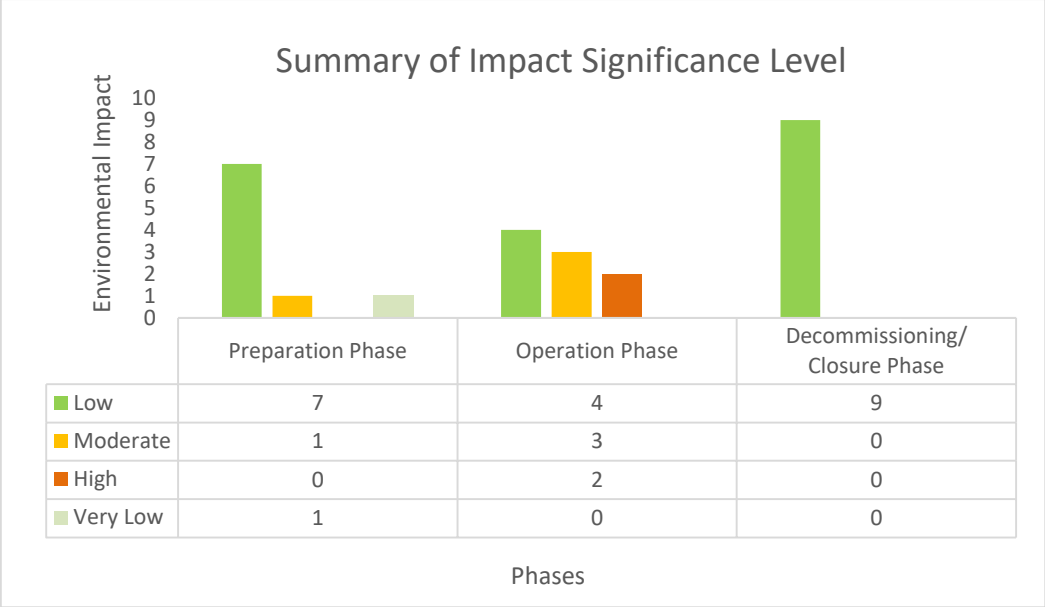
ဆန်းစစ်ခြင်း	သတ်မှတ်ချက်				
	၁	၂	၃	၄	၅
ပြင်းအား	မသိသာ	သိသာမှု အနည်းငယ်ရှိပြီး လုပ်ငန်းခွင်တွင် သက်ရောက်မှု မရှိ	သိသာမှု အလည် အလတ်ရှိပြီး လုပ်ငန်းခွင်တွင် သက်ရောက်မှု အနည်းငယ်ရှိ။	သိသာမှုများပြီး လုပ်ငန်းခွင်တွင် သက်ရောက်မှု ထင်ရှား။	သိသာမှု အလွန် များပြီး လုပ်ငန်းခွင်တွင် ပြောင်းလဲမှု ထင်ရှား။
ကြာချိန်	၀- ၁ နှစ်	၂- ၅ နှစ်	၆- ၁၅ နှစ်	လုပ်ငန်း လည်ပတ်ချိန် တစ်လျှောက်	လုပ်ငန်း ဖျက်သိမ်းသည် အထိ
ပျံ့နှံ့နိုင်မှု	လုပ်ငန်းခွင် အတွင်းသာ	အနီးအနား ပတ်ဝန်းကျင်ထိ	ဒေသတွင်း	နိုင်ငံတွင်း	နိုင်ငံတကာထိ
ဖြစ်နိုင်စွမ်း	လုံး၀ မဖြစ်နိုင်	မဖြစ်နိုင်	ဖြစ်နိုင်သည်	အလွန်ဖြစ်နိုင် သည်။	ဖြစ်နိုင်မှု သေချာသည်။

ထိခိုက်မှုများကို အောက်ဖော်ပြပါ ပုံသေနည်းအတိုင်းတွက်ချက်သည်။

ထင်ရှားမှု= (ပြင်းအား+ ကြာချိန်+ ပျံ့နှံ့နိုင်မှု) * ဖြစ်နိုင်စွမ်း

ထိခိုက်မှုများ၏ ထင်ရှားမှုများကိုအောက်ပါအတိုင်း အပိုင်းငါးပိုင်းခွဲခြားနိုင်သည်။

ထင်ရှားမှု	ထိခိုက်မှုများ၏ ထင်ရှားမှု
<၁၅	အရမ်းနည်းသည်။
၁၅-၂၉	နည်းသည်။
၃၀-၄၄	အလယ်အလတ်ဖြစ်သည်။
၄၅-၅၉	မြင့်သည်။
>၆၀	အလွန်မြင့်သည်။



ထိခိုက်နိုင်မှုများကို လေ့လာဆန်းစစ်ချက်အရ စီမံကိန်းဆောင်ရွက်ချက်များမှာ ထိခိုက်နိုင်မှု နည်းပါးပြီး အခြားလုပ်ဆောင်ရွက်ချက်များမှာ ထိခိုက်နိုင်မှု အလယ်အလတ် နှင့် မြင့်မားသည့် အခြေအနေတို့တွင် တည်ရှိနေပါသည်။ ထိုသက်ရောက်မှုများကိုလည်း သင့်တော်သော လျော့ချ နိုင်မည့်နည်းလမ်းများကိုလည်း ထည့်သွင်းဖော်ပြထားပါသည်။ လူမှုစီးပွားဖွံ့ဖြိုးတိုးတက်လာခြင်း သည်စီမံကိန်း၏ကောင်းကျိုးသက်ရောက်မှု ဖြစ်သည်။ အသေးစိတ်ကို အခန်း (၇) တွင်ဖော်ပြထား ပါသည်။

အများပြည်သူသဘောထားရယူခြင်းအခမ်းအနားကို ၂၀၁၉ ခုနှစ်၊ ဇွန်လ (၁၅) ရက်နေ့တွင် မယ်ကရိကျေးရွာ၊ ကျိုက်မရောမြို့နယ်၊ မွန်ပြည်နယ်တွင်ကျင်းပပြုလုပ်ခဲ့သည်။ စီမံကိန်းမန်နေဂျာ ဦးတင်ဦးမှ အဆိုပြုစီမံကိန်း၏အကြောင်း၊ ရင်းနှီးမြှုပ်နှံမှုပမာဏနှင့် ၄င်းတို့၏ အနာဂတ်အစီအစဉ် ကိုရှင်းလင်းတင်ပြခဲ့သည်။ ထို့နောက် အီးဂတ်ပတ်ဝန်းကျင်ဆိုင်ရာဝန်ဆောင်မှုလုပ်ငန်းမှ ဒါရိုက်တာ ဦးတင်အောင်မိုးမှ ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်း၏ ရည်ရွယ်ချက်၊ စီမံကိန်းဆိုင်ရာအချက်အလက်များစုဆောင်းပေးခြင်း၊ ပတ်ဝန်းကျင်ဆိုင်ရာ ထိခိုက်မှုများကို တွက်ချက်ခန့်မှန်းခြင်း နှင့် လျော့နည်းအောင်ပြုလုပ်ရမည့်နည်းလမ်းများကို အကြုံပြုတင်ပြခြင်း၊ လူမှုစီးပွားတာဝန်ယူမှု အစီအစဉ် (CSR Plan)၊ ပတ်ဝန်းကျင်ဆိုင်ရာ စောင့်ကြပ်ကြည့်ရှုမှု အစီအစဉ်များ ပါဝင်သည့် ပတ်ဝန်းကျင်ဆိုင်ရာ စီမံခန့်ခွဲမှုအစီအစဉ် (EMP) ပြင်ဆင်ချက်များကို ရှင်းလင်းတင်ပြခဲ့သည်။ အသေးစိတ် အကြံပြုချက်များ၊ အမေးအဖြေများကို အခန်း (၈) တွင်ဖော်ပြထားပါသည်။

ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်တွင် ဖြစ်ပေါ်နိုင်သည့် ပတ်ဝန်းကျင်ထိခိုက်မှုများ၊ ထိခိုက်မှု အရင်းအမြစ်များ၊ ထိခိုက်မှုများကိုလျော့ချပေးနိုင်မည့်ရှောင်လွှဲရန်နည်းလမ်းများ၊ ကျန်ရှိမည့် ထိခိုက်မှုများနှင့် ဆောက်လုပ်ရေးကာလ၊ လုပ်ငန်းလည်ပတ်ခြင်းကာလနှင့် ဖျက်သိမ်းခြင်းကာလ အစီအစဉ်တွင် လေ နှင့် ရေ အရည်အသွေး၊ ဆူညံသံပမာဏ၊ မီးဘေးအန္တရာယ်၊ လုပ်ငန်းခွင် ဘေးအန္တရာယ်၊ စွန့်ပစ်ပစ္စည်းများ စသည်တို့သည်ပတ်ဝန်းကျင် အပေါ်တွင်သက်ရောက်မှုရှိနိုင်ပြီး လူမှုစီးပွားအခြေအနေ ပေါ်တွင်ကောင်းကျိုး ဖြစ်စေမည်။ ထိုသက်ရောက်မှုများကိုလျော့ချရန် နည်းလမ်းများကိုလည်း EMP အပိုင်းတွင် အသေးစိတ် ဖော်ပြထားသည်။ စောင့်ကြပ်ကြည့်ရှုမှု အစီအစဉ်တွင် စီမံကိန်းဆောင်ရွက်နေစဉ် ကာလအတွင်း လေ၊ ရေ၊

မြေအရည်အသွေးနှင့် ဆူညံသံပမာဏတို့အတွက် စောင့်ကြပ်ကြည့်ရှုရန် တာဝန်ရှိသောပုဂ္ဂိုလ်များ၊ တိုင်းတာရန်အကြိမ် အရေအတွက်များစသည်တို့ပါဝင်သည်။ ပတ်ဝန်းကျင်ဆိုင်ရာစီမံခန့်ခွဲမှုအစီအစဉ်ကို အကောင် အထည် ဖော်ဆောင်ရွက်ရန် ခန့်မှန်းကုန်ကျစရိတ်မှာ အမေရိကန်ဒေါ်လာ (၄၃၃၈၅၀) ခန့် လျာထားပါသည်။ လူမှုစီးပွားတာဝန်ယူမှုအစီအစဉ်တွင် ဝန်ထမ်းများနှင့် မိသားစုများ၏လူနေမှုဘဝ လုံခြုံစေရန်၊ အနီးအနားရှိ အဖွဲ့အစည်းများနှင့် ပိုမိုကောင်းမွန်သောနေထိုင်မှုစနစ်နှင့် ပွင့်လင်းရင်းနှီးသော ဆက်ဆံမှုရရှိရန်အတွက် လည်းရည်ရွယ်ထားပါသည်။ အနီးပတ်ဝန်းကျင်ရှိ ဒေသခံများအတွက် လူမှုစီးပွားဖွံ့ဖြိုးရေးရန်ပုံငွေကို ပေးဆောင်ရန်လည်းတာဝန်ရှိပါသည်။ မကျေလည်မှုများကိုဖြေရှင်း ပေးမည့်အစီအစဉ်တွင် စီမံကိန်းနှင့် ပတ်သက်၍ မကျေလည်မှုများ ပေါ်ပေါက်လာပါက ဖြေရှင်း နိုင်မည့်နည်းလမ်းများကို ဖော်ပြထားသည်။ အရေးပေါ်ကိစ္စရပ်များအတွက် ကာကွယ်မှုနှင့် တုံ့ပြန်မှု အစီအစဉ်တွင် အရေးပေါ်ကိစ္စရပ်များကို ကြိုတင် ကာကွယ်ရန်နှင့် ဖြစ်ပေါ်လာပါကတုံ့ပြန်ရန် နည်းလမ်းများပါဝင်သည်။ အချုပ်အားဖြင့် ပတ်ဝန်းကျင်ဆိုင်ရာ စီမံခန့်ခွဲမှုအစီအစဉ်တွင် စီမံကိန်းကြောင့် ဖြစ်ပေါ်လာနိုင်သော ပတ်ဝန်းကျင်အပေါ်ကောင်းကျိုး၊ ဆိုးကျိုးများ ကိုစနစ်တကျလေ့လာပြီး ဆိုးကျိုးများကို စောင့်ကြပ်ကြည့်ရှုရန်နှင့် လျှော့ချရန်နည်းလမ်းများကို ကာလအားလုံးအတွက် သတ်မှတ်ထားပါသည်။ အစီအစဉ်အသေးစိတ်များကို အခန်း (၉) တွင်ဖော်ပြထားပါသည်။

အကျဉ်းချုပ်အားဖြင့် ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံ၏ လမ်းညွှန်မူများ၊ ပတ်ဝန်းကျင်ဆိုင်ရာဥပဒေ၊ နည်းဥပဒေစည်းမျဉ်းစည်းကမ်းများနှင့် ချမှတ်ထားသော မူဝါဒလမ်းညွှန်ချက်များအတိုင်း ပတ်ဝန်းကျင် ဆိုင်ရာစီမံခန့်ခွဲမှုအလေ့အကျင့်များ၊ လုပ်ငန်းစဉ်များနှင့် လိုက်နာဆောင်ရွက်ကျင့် သုံးရန်တာဝန်များကို ဤကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်းအစီရင်ခံစာတွင် ဖော်ပြတင်ပြထားပါသည်။ စီမံကိန်းနှင့်သက်ဆိုင်သူများ အား စီမံကိန်းဆိုင်ရာအကြောင်းရာများရှင်းလင်းတင်ပြခြင်း၊ အကြုံပြုချက်များနှင့် ဆွေးနွေးတင်ပြလာသော သဘောထား အကြံဉာဏ်များကိုရယူပြီး အဆိုပါကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်းအစီရင်ခံစာ၏ ပတ်ဝန်းကျင် ဆိုင်ရာစီမံခန့်ခွဲမှုအစီစဉ်တွင် ထည့်သွင်းရေးသားခဲ့ပါသည်။

CHAPTER 1
INTRODUCTION

1.1 BACKGROUND OF THE STUDY

This Initial Environmental Examination (IEE) was developed based on site assessment of the proposed Clay soil production project. The proposed project is intended to perform clay soil production operation for June cement factory that existing near Malkaro Village, Kyaikmaraw Township, Mawlamyine, Mon State for 30 years period. The land area of the proposed project for clay soil production operation is approximately 100 acres.

June Cement Industry Ltd. has submitted a proposal for cement production plant with a kiln capacity of 5000 t/d with an annual production of approximately 2.1 to 2.3 million tons of Portland cement manufactured by dry processing method in Myanmar, to Myanmar Investment Commission (MIC) in August 2015. In September 2016, Environmental Impact Assessment (EIA) Report for the whole project has been prepared and submitted to Environmental Conservation Department (ECD). ECD gives some comments on EIA report to carry out the separate Initial Environmental Examinations (IEEs) for main project activities such as mining. In this context, with an advice of E Guard Environmental Services the project proponent decides to prepare the separate IEE report of clay soil production of raw materials for cement factory.

In compliance with laws, rules and regulations of MONREC, the Initial Environmental Examination (IEE) is conducted for the proposed clay soil production operation, in order to identify the immediate and potential impacts of the project activities on physical, biological, socioeconomic and cultural environment of the proposed project site. The specific objectives of this study include:

- Identify the major issues that may arise as a result of the proposed activities on bio-physical, socioeconomic and cultural environment of the project area.
- Recommend practical and site-specific measures for environmental impact mitigation and environmental enhancement.
- Prepare and implement an environmental management plan for the project, and
- Make sure that the IEE is done sufficiently for the proposed project

As per the comments of (ECD), the proposed project requires an IEE to meet the environmental assessment requirements of Environmental Impacts Assessment Procedures (2015). Therefore, June Cement Industry Limited appoints E Guard Environmental Services for conducting IEE studies and preparing the report. E Guard Environmental Services has prepared this Initial Environmental Examination (IEE) according to the Environmental Impact Assessment (EIA) procedure (2015).

This IEE report is prepared (1) to initially assess the potential impacts of the proposed clay soil production project on environmental components and communities nearby, (2) to develop adequate and feasible mitigation measures and monitoring programs, and (3) to keep residual impacts of the project within acceptable limits in order to ensure successful implementation of the proposed project. The schematic processes of Environmental approval in the IEE procedure**s** are shown in **Figure 1.1.**

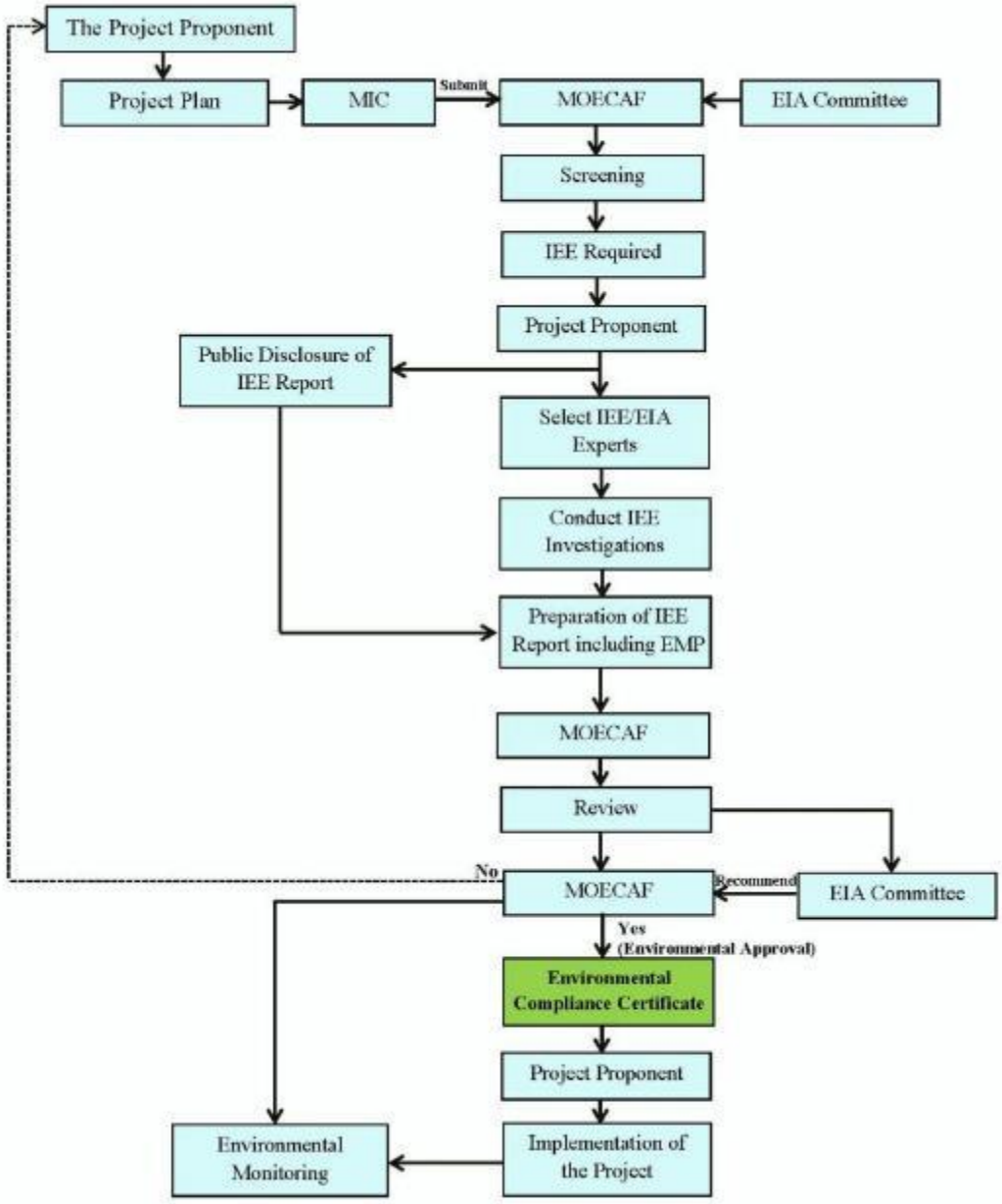


Figure 1. 1 Schematic Processes of Environmental Approval

1.2 SCOPE OF THE STUDY

The study on existing environmental resources in the project area focused on two main resources: the primary data and the secondary data. The primary data collection of current physical environment such as air, water and soil qualities inside the project area was carried out during the site visit period to obtain existing information of the project's physical environment. The secondary data on physical and socioeconomic conditions of the project area were collected as reference materials from relevant ministries and research institutes for the preparation and formulation of IEE report. The data collection process is done by direct observation, surveying and sampling. Moreover, the IEE report comprises baseline data on

existing conditions, together with the anticipated environmental impacts and proposed mitigation measures. The study is done by considering the potential impacts of the activities in all these phases of the project: site preparation, operation and decommissioning/closure phases.

1.3 MATERIALS AND METHODS

The method adopted for this project site consists of field work in which water and soil samples were collected, air quality and noise level were measured, field observations to determine the physical, environmental impact of mining and the laboratory work in which representative samples collected from the field were analyzed for their physical and chemical properties contents.

i) Field Work

The field work was carried out within the designated place of the study area. The representative surface water samples were collected near irrigation scheme and Ataran River which are near project site. These samples were carefully put in plastic bottles and labeled.

The representative soil sample was randomly collected from the surface using a shovel from the areas within the clay soil project site. The sample collected was described based on their color, texture and carefully put in plastic bags and labeled.

The representative air qualities ($PM_{10,}$ $PM_{2.5,}$ NO_2, SO_2 and O_3) were measured from the surface using an EPAS, with sensors and casing from the operation site. Noise level measuring was also carried out within the project site. The field studies were carried out by members of E Guard Environmental Services. The team studied the field survey with the following professional experts and the survey period was from March 10, 2019 to March 12, 2019.

The IEE study survey team members are listed below:

1) U Tin Aung Moe (Director)
2) U Aung Myint Myat
3) U Thaw Tar Htun
4) U Kyaw Soe Moe
5) U Aung Moe Oo
6) Daw May Thu Win
7) Daw Thet Shwe Yee Aung
8) U Khin Zaw Min

Table 1. 1 Describes the devices used to collect baseline environmental data for the proposed project

Davis Vantage Pro2 Wireless Weather Station Provides detailed current weather conditions and expanded forecasts - all at a glance! The Vantage Pro2 uses a frequency-hopping spread spectrum radio from 902 MHz to 928 MHz to transmit and receive data up to 1,000' (300m) line of sight. In addition, the weather station features a bubble level, improved anemometer base, redesigned wind cups, and factory-calibrated wind direction. The integrated sensor suite combines temperature and humidity sensors, rain collector with an aluminum-plated tipping bucket, and anemometer into one package for easy setup. Measure inside and outside temperature and humidity, heat index, barometric pressure, dew point, rainfall, wind direction and speed, and wind chill.	
Haz-Scanner EPAS PM_{10}, PM $_{2.5}$, NO_2, SO_2, CO, CO_2, Temperature, and Relative Humidity	
Digital Sound Level Meter Noise and Vibration	
Aeroqual S 500	

iii) Field Observations

During the field work, observation of the whole project site was done so as to evaluate the physical impact of the clay soil production operation area. The current land use of the proposed project area is agricultural land so the project proponent will conduct the necessary clearance work in environmentally sound manner for the clay soil production.

iv) Laboratory Work

The water samples were analyzed in the ISO Tech Laboratory and SGS. The soil sample was analyzed at the United Analyst and Engineering Consultant Co., Ltd.

E Guard Environmental Services had prepared and submitted an Initial Environmental Examination report to explain the environmental impacts of the project and other existing and planned activities in the operation area, in combination with the project. The IEE report and application had been prepared in accordance with the requirements prescribed under the Ministry of Natural Resource and Environmental Conservation (MONREC).

CHAPTER 2
PROJECT DESCRIPTION

2.1 BASIC PROJECT INFORMATION

The purpose of the project is to extract clay soil as raw material for cement production during the operational phase, to provide employment opportunities for local residents. June Cement Industry Limited needs raw material such as clay soil, laterite, and limestone for cement production. According to the cement composition ratio, clay soil will be needed to extract daily 10% (500 ton per day) of total production amount of cement 5000 tons/day. However, only 6% (300 ton per day) will be extracted from the proposed clay mine site because clay content in laterite sample from laterite mine (June Cement Industry Limited) is 4% as a laboratory analysis result. As the proposed project site is located adjacent to the Ataran River, project proponent will extract clay soil 150 meters away from the boundary of Ataran River to ensure that there is no disturbance the waterway and pollution the water quality. Operation process will break during raining season because flooding may occur around the project area.

The facilities of the proposed project include one-storey office building and dormitory, workshop, machine garage, water storage tank, toilet and etc. According to the MIC permit, preparation will start within 2 years for clay soil production. During the operational phase, it is intended to extract clay soil for the period of 30 years. After the operation phase, the proponent will rehabilitate the project area during decommissioning phase and close out phases of the project. The project proponent had got using farmland by other means permit approximately (100 acres) from Department of Agricultural Land Management and Statistics that is described in **Appendix 7.**

Table 2. 1 Project Information

Project Name	: Clay Soil Production Project
Project Location	: Malkaro Village, Kyaikmaraw Township, Mawlamyine, Mon State
Project Owner	: Daw Nu Nu Win
Designation	: Managing Director
Type of Business	: June Cement Industry Ltd.
Principle Company's Address	: No. 80, Sayar San Street, Bahan Township, Yangon, Myanmar
Contact Number	: +95 92005445, +95 19010660

2.2 INVESTMENT PLAN

The total investment of June Cement Industry Limited for cement production will be around USD 47 million. Clay soil Production is the branch of it so that 20% of the total investment will be used for developing the clay soil production including machineries, equipment and equity.

2.3 LOCATION OF PROJECT, OVERVIEW MAP AND SITE LAYOUT PLAN

2.3.1 Location of Project and Overview Map

June Cement Industry Ltd. had made 30 years land lease contract according to the permission of Myanmar Investment Commission (MIC), for clay soil mine operation near Malkaro Village, Kyaikmaraw Township, Mawlamyine, Mon State and it is located only 0.17 miles away from the Cement Industry which is just across from the operation site. It is connected by road to Kyaikmaraw which links with Phar Auk and Mawlamyine. The land area of the proposed project for clay soil mining operation is approximately 100 acres. The elevation is from 12 ft above sea level. The location map of the proposed project site is shown in **Figure 2.1**.

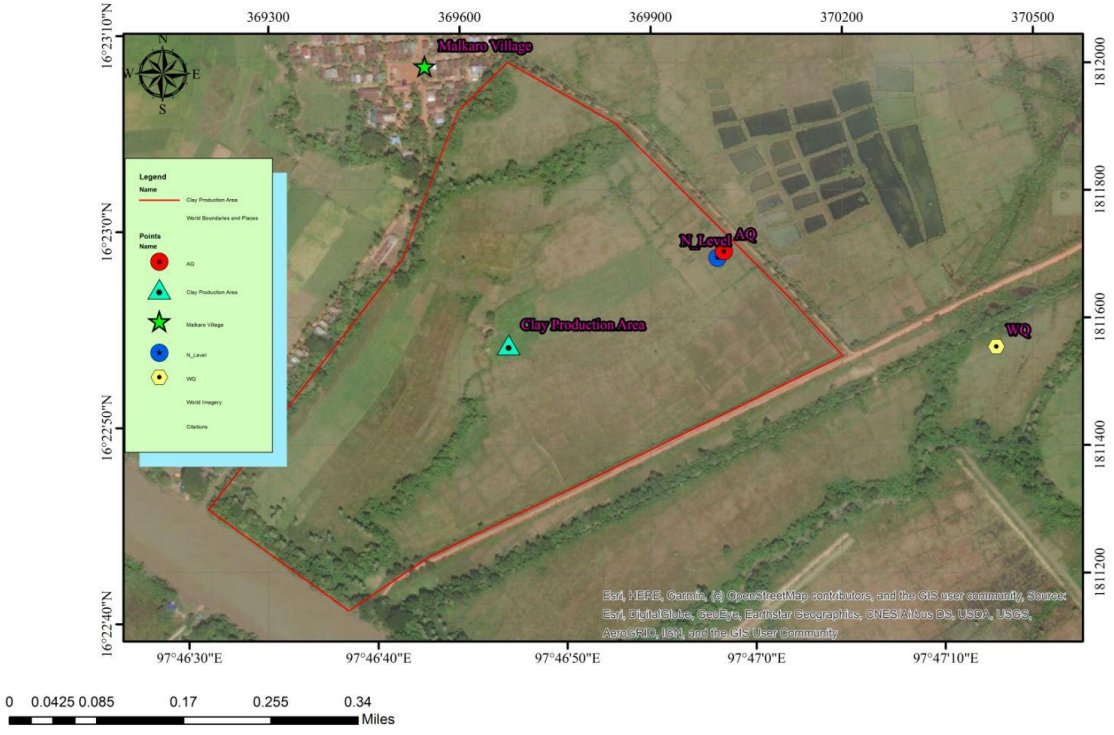


Figure 2. 1 Location Map of the Proposed Project Site

Clay soil production operates within an area of approximately 100 acres. Total project area which will include related buildings and facilities, topsoil dumping yard and clay soil production area. In the project area, there are four buildings which will use as machine

garage, workshop, one-story office, staff dormitory and toilets. Moreover, a sedimentation pond must be constructed to utilize as wastewater collection pond for site runoff water and dewatering. In addition, one generator (3 kVA) will use as lighting mining operation on the project site. The layout plan of the proposed project site is shown in **Figure 2.2**.

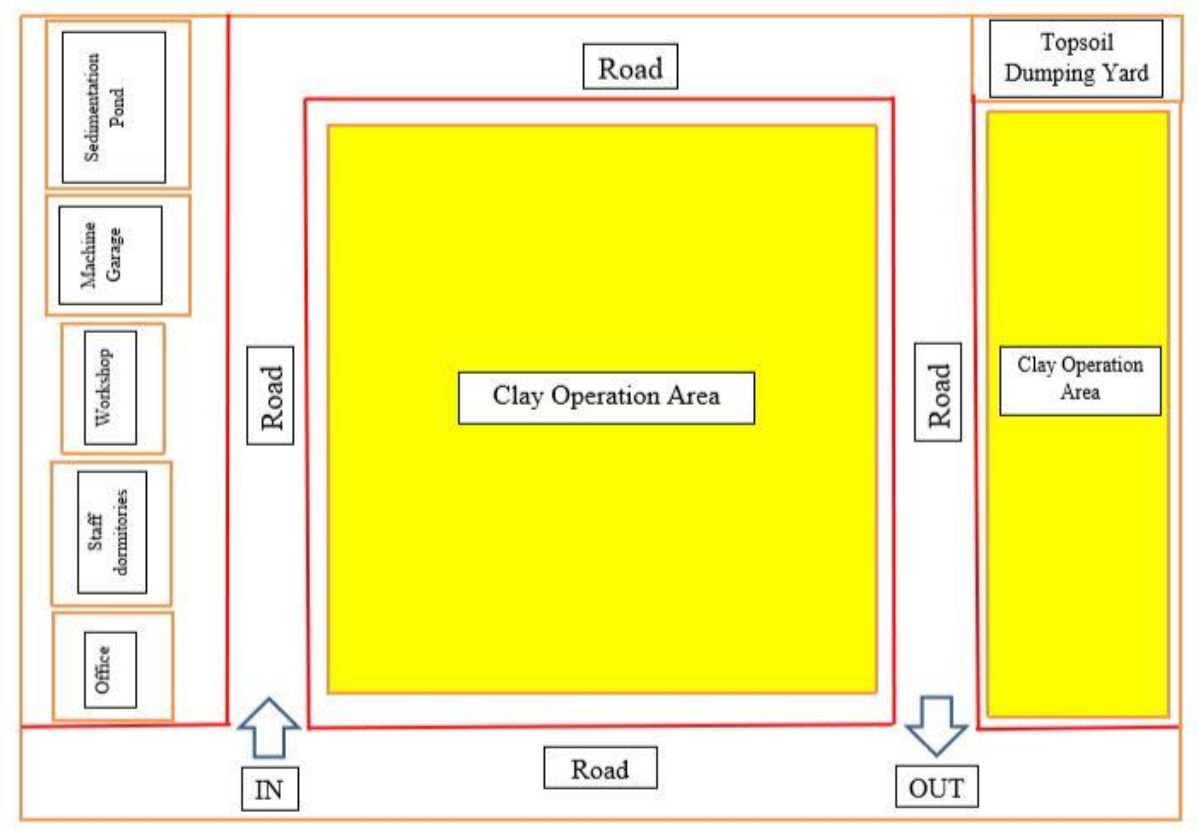


Figure 2.2 Layout Plan of the Proposed Project Site

2.4 PRODUCTION PROCESS

(1) Site Clearing

Quarrying is an "Open Cut" process which requires clearing someway in front of working surfaces. Vegetation, topsoil and small amount of overburden will be progressively removed by bulldozers and excavators to expose the hard rock resource. Topsoil and overburden, where available, will be stockpiled separately for later use in rehabilitation. In some instances, topsoil and overburden will be applied directly to area undergoing rehabilitation or where overburden is required for the stabilization of landscape.

(2) Topsoil Removing

Before clay mining operation will take place, topsoil removing and stockpiling process will be carried out by using hydraulic excavators, bulldozers and dump trucks.

(3) Clay Soil Production

In the project area, clay soil will be extracted from the surface of the ground or beneath the surface. There are several techniques and process by which clay soil may be extracted from the earth. Open cast mining method will mainly use in the project site. Open cast mining is a type of strip mining in which the clay deposit extends deep in the ground, necessitating the removal of layer upon layer of topsoil. The removal of topsoil is 3ft depth and the clay soil is soft in nature, therefore drilling and blasting is not required, it will excavated directly from its in situ position by excavator, so no overburden dumps and no waste stockpile will be generated from the clay soil production.

(4) Clay soil Handling and Transportation

Clay soil will be excavated by hydraulic excavator and then loaded by dump trucks to store temporarily in clay soil stockpile. It will be transported by dump trucks to cement plant.

(5) Mine Dewatering

Mine dewatering is the process of controlling and managing surface water and groundwater to allow mining in relatively dry conditions, to improve geotechnical stability and to improve the efficiency of mining methods. According to the site survey observations in Malkaro Village, water level of water table well in unconfined aquifer is 12 feet from the ground level. Therefore, the project proponent must consider implementing a planned dewatering system to be more efficient working conditions such as trafficking, diggability and reducing downtime due to pit flooding.

(6) Sedimentation Pond

A sedimentation pond is a temporary settling pond designed to slowly release runoff, detaining it long enough to allow sediment to settle out. Moreover, it intercepts stormwater before it reaches the waterway, and slows it down to allow the coarse sediment to fall to the bottom. In the preparation and operation phases, ground water can be discharged due to the excavation activities. Therefore, dewatering process must be conducted. Water from the dewatering process must be discharged to the surrounding environment after passing through the sedimentation pond.

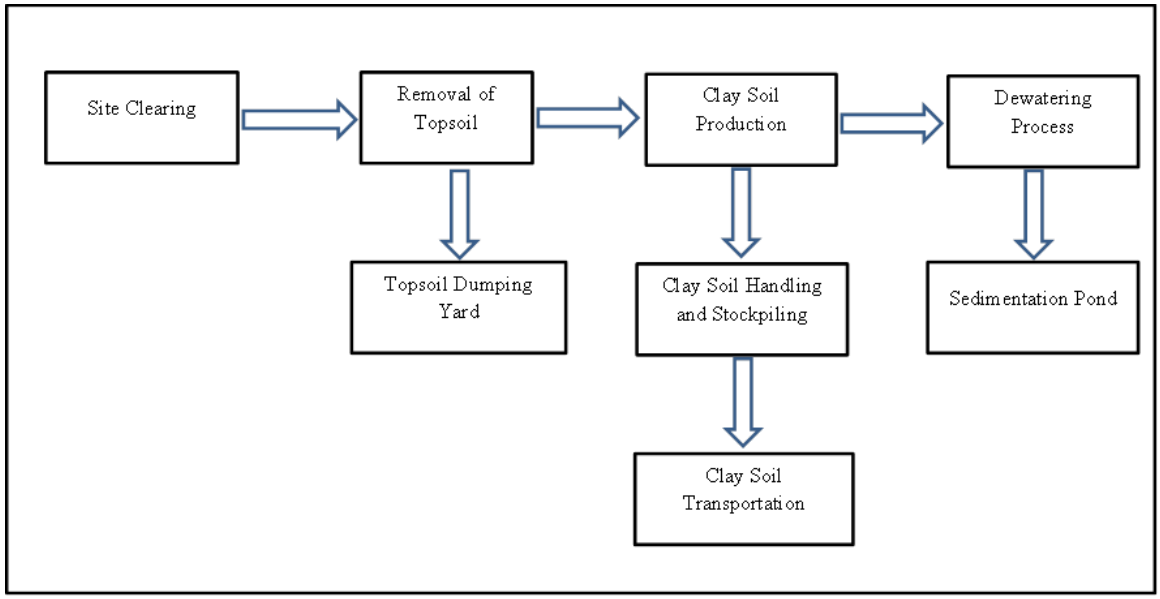


Figure 2.3 Production Process Flow Chart of proposed project

2.5 HUMAN RESOURCE REQUIREMENT

A total 12 workers from local are employed to work for the clay soil mining operation. During operation, the management of the process will be operated on one shift during day time starting from 8:00 AM to 5:00 PM including lunch time. The working week is start from Monday morning till Saturday noon. Adequate housings are supplied for accommodation services of all workers at staff housings of June cement plant. The requirement of workers during operation in the project is shown in **Table 2.2**.

Table 2. 2 Human Resources Requirement

No.	Designation	Number of Employees
1.	Supervisor	1
2.	Office Staff	1
3.	Operators	5
4.	Drivers	5
Total		**12**

2.6 REQUIREMENT OF MACHINERY AND EQUIPMENT

During the operation phase, required machines are to be purchased locally. The proposed project site has also utilized hydraulic excavator, bulldozer, wheel loader, generator and etc. for clay soil production operation. Detailed machines and equipment are shown in **Table 2.3**.

Table 2. 3 Machine and Equipment List of the Project Site

Sr No.	Particular	Machinery (Quantity)
1.	Hydraulic excavator	1
2.	Generator	1
3.	Bulldozer	1
4.	Wheel loader	1
5.	Dump truck	4
Total		**8**

Figure 2.4 Bulldozer

Figure 2.5 Dump Trucks

Figure 2.6 Excavator

Figure 2.7 Wheel loader

2.7 AMOUNT OF PRODUCTION

June Cement Industry Limited will produce 5000 cement tons per day. Clay soil will be used in only production of cement (June Cement Industry Limited) so clay production amount is based on the cement production amount. According to the raw mix calculation, 10% clay soil will be needed to produce cement so that the total amount of clay soil extraction for production of 5000 tons of cement will be around 500 tons of clay soil will be needed to extract per day.

2.8 WATER REQUIREMENT AND CONSUMPTION

There is no water usage for extraction of clay soil. Requirement of domestic usage will be supplied by tube well. In addition, for domestic water, the water from the tube well will be

pumped to an elevated water tank in the project site. Staffs domestic water will be used about 70 gals per person per day so the storage water tank will be constructed at project site and the water storage tank volume is 1000 gals. Purified drinking water will be supplied all time for every staffs.

2.9 SOURCE OF POWER SUPPLY AND DIESEL CONSUMPTION

The proposed development would result in increased fuel consumption. The main source of electricity supply will be obtained from one generator with a capacity of 3 KVA will be used as lighting. Approximately 100 gallons of diesel are required daily for generators, trippers and heavy machines, about 3000 gallons diesel per month purchases from the local market (Mawlamyine) and transport to the project area by car. The daily fuel requirement for the generator and machines is stored in the oil barrel in the project site.

2.10 PRODUCTION PROCESS AMOUNT OF WASTES/SOLID, LIQUID AND GAS

2.10.1 Solid Waste

The clay soil will be excavated directly from its in situ position by excavator, so no overburden dumps and no waste stockpile will be generated from the clay soil production. General domestic solid wastes are also generated from the staffs. Estimated solid waste generation rate will be 0.6 kg per person per day. Since there are total 12 staffs in the project site, total solid waste amount produced per day is 7.2 kg and 216 kg of waste will be generated per month. These domestic solid wastes will be collected at designated waste dump within the project site and then destroyed by fire.

2.10.2 Liquid Waste

Wastewater may be generated from dewatering process during the clay soil production process. Sedimentation pond will be provided in the project site to retain the wastewater and settle down the suspended solids containing in the discharged wastewater. This water will be used for plantation and spraying on haul road. There is no beneficiation mineral within the project area hence, no wastewater generation. However, domestic liquid waste will be generated by staffs. Non-hazardous liquid waste is staff personal discharge amount is 60 gals per person and there are total 12 staffs, total amount of water discharged from the project is 720 gals. Approximately 70% of this water is domestic waste water, 504 gals are discharged into septic tank. Remaining 30% of produced water (216 gals) is discharged outside the project site. They flow into the near project area. Hazardous liquid waste will generate by machine workshop and diesel oil storage tank.

2.10.3 Gas Emission

Air emission impact is Carbon-dioxide emission from the electric generator, heavy machine and tripper. In the project area, one generator will be used for electricity source for lighting staffs. Those generators diesel consumption is average 100 gallons per day. Carbon

dioxide amount emission from heavy machine and tripper can't be determined. Thus, the total amount of CO_2 emissions from the generator can be calculated as shown in below **Table 2.4**

Table 2. 4 Quantity of CO_2 Emissions from the Generator

Description	Metric Tons of CO_2 emission factor	Resource Consumption per day	Kilo Tons of CO_2e/ per day	Kilo Tons of CO_2 per Month	Kilo Tons of CO_2e per year
Diesel (Generator)	0.010	100 gallons	0.001	0.03	0.36

Source: World Resources Institute GHG Calculation for Stationary and Mobile Sources (2006)

The average amount of CO_2 emission from the generator is 0.36 kilotons CO_2 per year. According to EBRD Greenhouse Assessment Methodology, minimum CO_2 emission from the operation of facilities is <20 ktonsCO_2e per year. Therefore, the amount of GHG emissions is low when considered on the EBRD standard of CO_2 emission and there will be only a minor impact in the surrounding area.

In order to find out the air pollution due to GHG emissions, EBRD has developed a standard that will assess CO_2 emissions due to operation of project sectors. (See CO_2 Emission standards in **Table 2.5**.

Table 2. 5 EBRD Standard of CO_2 Emission

Category	Range
Negligible	No GHG assessment necessary
Low	< 20kt/y CO_2- equivalence (CO_2 –e)
Medium – Low	20 – 100 kt CO_2- equivalence (CO_2 –e)
Medium- high	100 kt- 1 Mt CO_2- equivalence (CO_2 –e)
High	> 1 Mt CO_2 – e

2.11 PROJECT ALTERNATIVES

This section considers the selected alternative to 'no project alternative'. There were no other alternative site locations considered for the project because clay soil can be extracted and supported sufficiently for cement production of June Cement Industry Limited which is located adjacent to the project site.

No Action Alternative

The following positive impacts are anticipated by choosing this alternative:

- There will have no impact (even minimal) from any construction and extraction activities
- No light pollution, emissions, noise and any other (even minimal) impacts on the surrounding environment will be expected so natural resources and biodiversity will be impacted by the activities of the project
- No additional human presence (Staffs) will be expected
- There will be less traffic movement around the project site

In the meantime, the following negative impacts are anticipated:

- Lack of job opportunity
- Cement production cost will be higher due to the lack of clay soil demand for cement production plant which is located near the proposed clay soil extraction site.
- Traffic load will be raised definitely in surrounding environment due to the raw material transportation activities.

CHAPTER 3

IDENTIFICATION OF THE PROJECT PROPONENT

3.1 PROJECT PROPONENT INFORMATION

The project proponent of the clay soil production project is June Cement Industry Limited, which is a 100 % local investment. June Cement Industry Limited's company registration certificate had attached in **Appendix 6**. The proposed duration of the investment is 30 years. Detailed information of the project proponent is shown in **Table 3.1.**

Table 3. 1 Project Proponent Information

No.	Name	NRC Number	Designation	Address
1.	Daw Nu Nu Win	10/Ma La Ma (C) 143240	Managing Director	No.80, Sayar San Street, Bahan Township, Yangon.
2.	U Aung Moe	12/Ah La Na (C) 033634	Director	No.11/13, Thayaphe Street, Ahlone Township, Yangon.
3.	U Myint Khaing	12/Ka Ta Ta (AC) 000291	Director	No.80, Sayar San Street, Bahan Township, Yangon.
4.	U Myint Soe	12/BaHaNa (C) 048684	Director	No.27, Shwe Taung Gone Yeik Thar, Inlyar Myaing Street, Bahan Township, Yangon.

CHAPTER 4

IDENTIFICATION OF THE IEE EXPERTS

4.1 STUDY TEAM FOR INITIAL ENVIRONMENTAL EXAMINATION

The Initial Environmental Examination (IEE) with the Environmental Management Plan (EMP) for the proposed project is prepared by E Guard Environmental Services. E Guard Environmental Services started this IEE report preparation on July 2019 in line with Myanmar Environmental Conservation Law and Regulation for clay soil production project of June Cement Industry Limited. Consultant Registration Certificates had attached in **Appendix 10.** Initial Environmental Examination members of the E Guard Environmental Services for the proposed project are as follows:

Table 4. 1 IEE Study Team and their Responsibility

No.	Name	Position	Transitional Consultant Registration Numbers	Role
	E Guard Environmental Services	EIA Organization	0028	
1	U Tin Aung Moe	Project Leader	10103	Overall responsibility for IEE Project Report Preparation
2	U Aung Myint Myat	Team Leader	10099	Project Management and Review
3	U Thaw Tar Htun	Team Member	-	Project Management
4	Daw Thein Mwe Khin	Team Member	10104	Socio-Economist
5	U Kyaw Soe Moe	Team Member	-	Report Writing, Social Survey, Public Consultation, Environmental Assessment, Impact Identification and Analysis
6	U Aung Moe Oo	Team Member	-	Environmental Quality Measuring and Analysis
7	Daw May Thu Win	Team Member	-	Laws and Legislation
8	Daw Thet Shwe Yee Aung	Team Member	-	Social Survey data entry, Assist for Database requirements
9	U Khin Zaw Min	Team Member	-	Field Surveyor for Environmental Quality

				Data

U Tin Aung Moe (Director)

U Tin Aung Moe is a Consultant who holds Transitional Consultant Certificate No 0103; described expertise is Facilitation of meeting, Land use, Risk Assessment and Hazard Management, RS and GIS. He is one of the founding members of E Guard. He has been working for Environmental Assessment and Environmental Technologies development and capacity building for the Developing countries in Asia and Pacific Region. He is responsible for the policy and institutional linkages and harmonization of E Guard.

U Aung Myint Myat (Associate consultant)

U Aung Myint Myat is an Associate Consultant, who holds Transitional Consultant Certificate No. 0099, described expertise is Forestry. He has Bachelor Degree in Forestry from the University of Forestry in 2014. He has four years experiences on environmental site surveys and also socio-economic surveys. Another experience is to cooperate with clients, government authorities and local people to conduct stakeholder engagement and public consultation meeting. He also participates in the activities of social survey, biodiversity survey, and reviewing the reports.

U Thaw Tar Htun (Associate Consultant)

U Thaw Tar Htun is an Associate Consultant working on EIA project reporting in E Guard Environmental Services Co., Ltd. since 2018. He received Bachelor of Civil Engineering from Taunggyi Technological University in 2011 and Master of Engineering in (International Graduate Program in Environmental and Water Resources Engineering) from Mahidol University, Thailand in 2016. He had experiences in environmental fields for 4 years including his master degree research, "Mathematical Modelling Wastewater Collection System in Cha-Am Municipality using PCSWMM". His master thesis paper was presented in 3rd International Conference on Civil, Biological and Environmental Engineering Conference, Phukhet, Bangkok. He had worked as a Sub Assistant Engineer at Engineering Department (Water and Sanitation) at Naypyitaw Development Committee, Naypyitaw, Naypyitaw Union Terrority from August 2012 to October 2017.

Daw Thein Mwe Khin (Associate Consultant)

Daw Thein Mwe Khin is an Associate Consultant, who received her Master Degree in Regional and Rural Development Planning from Asian Institute of Technology and Bachelor Degree in Forestry from the University of Forestry. She has more than 4-year experience in communication with clients, regulators such as analytical laboratories. She is also familiar with conducting socio-economic survey for development projects and RAP as a team leader. Her contributions on preparation of this project are socio- economic questionnaire preparation and data analysis as a socio-economist.

U Kyaw Soe Moe (Project Associate)

U Kyaw Soe Moe is a Project Associate who received Bachelor of Civil Engineering from Taunggyi Technological University in 2016. He has nearly 2 years experiences in conduction stakeholder engagement, public consultation, social survey and site visit. His contributions on preparation of this project are report writing, social survey, public consultation, potential impact identification and analysis.

U Aung Moe Oo (Project Associate)

U Aung Moe Oo is a Project Assistant, who received his Bachelor Degree in Chemical Engineering from Technological University (Thanlyin) in 2016 and working in E Guard Environmental Services Co., Ltd. He has experience on environmental site survey and socio-economic surveys. He also specializes in environmental quality such as water quality, air quality and noise etc. He is also responsible for data analysis and interpretation of environmental baseline data.

Daw May Thu Win (Project Assistant)

Daw May Thu Win is working as project assistant in E-Guard Environmental Services Co., Ltd. She obtained her Bachelor Degree in Law from East Yangon University (Tarwa) in 2018. She is currently assisting in preparing Laws, Rules, Regulations, Policies, Directions and Notifications use for environmental reports, public consultations and information gathering process.

Daw Thet Shwe Yee Aung (Project Assistant)

Daw Thet Shwe Yee Aung is working as Project Assistant in E Guard Environmental Services. She completed her Bachelor Degree in Geology from University of Yangon in 2018. She went to Chauk, Popa, Kyauk Se Township and Southern Shan State to study the geological structure of those areas and also participated in writing geological reports. She has more than one experience in conduction stakeholder engagement and public consultation, site visit. She is currently assisting in preparing environmental reports, public consultation and information gathering processes.

U Khin Zaw Min (Surveyor)

U Khin Zaw Min specializes in instrumentation and field data collection of environmental condition of the site and measuring of environmental baseline data.

CHAPTER 5

POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

5.1 INSTITUTIONAL FRAMEWORK FOR ENVIRONMENTAL CONSERVATION

The Ministry of Environmental Conservation and Forestry (MOECAF) was re-organized as the Ministry of Natural Resources and Environmental Conservation (MONREC) on 30th March 2016 in order to undertake both environmental and natural resources conservation and management more effectively. Under Section 3 of the Environmental Impact Assessment Procedure (2015), pursuant to section 21 of the law and Articles 52, 53 and 55 of the Environmental Conservation Rules, all projects and project expansions undertaken by any organization, which may cause an impact on environmental quality, are required to obtain Prior Permission. This is to be in accordance with section 21 of the Environmental Conservation Law, and Article 62 of the Environmental Conservation Rules, having the potential to cause Adverse Impacts, are required to undertake IEE or EIA or to develop an EMP, and to obtain an Environmental Compliance Certificate (ECC) in accordance with this Procedure.

5.2 NATIONAL LAWS AND REGULATIONS

National laws and regulations for environmental protection applicable to the proposed project are compiled and presented in **Table 5.1**.

Table 5. 1 Relevant National Laws and Regulations of Myanmar

Laws and Regulations	Description
Constitution of the Republic of the Union of Myanmar (2008)	
The Constitution of the Union of Myanmar is the supreme law of the country and has provisions regarding the protection of the environment in Myanmar. Articles in the Constitution relevant to environmental protection are Articles 37, 42 and 390. They are quoted below:	
Article 37	(a) The Union is the ultimate owner of all lands and all natural resources above and below the ground, above and beneath the water and in the atmosphere in the Union; (b) The Union shall enact necessary law to supervise extraction and utilization of State owned natural resources by economic forces;
Article 42	The Union shall protect and conserve the natural environment.
Article 390	Every citizen has the duty to assist the Union in carrying out the following matters: (a) Preservation and safeguarding of cultural heritage; (b) Environmental conservation; (c) Striving for development of human resources; (d) Protection and preservation of public property. These three Articles in the Constitution provide a basis for legalizing and institutionalizing environmental health impact assessment and social impact assessment.
Myanmar National Environmental Policy (2019)	
Mission	To achieve a clean environment, with healthy and functioning ecosystems, that ensures inclusive development and wellbeing for all people in Myanmar.
Vision	To establish national environmental policy principles for guiding environmental

Laws and Regulations	Description
	protection and sustainable development and for mainstreaming environmental considerations into all policies, laws, regulations, plans, strategies, programs and projects in Myanmar.
National Land Use Policy (2016)	
Objectives	a. To promote sustainable land use management and protection of cultural heritage areas, environment, and natural resources in the interest of all people in the country; b. To strengthen land tenure security for the livelihoods improvement and food security of all people in both urban and rural areas of the country; c. To recognize and protect customary land tenure rights and procedures of the ethnic nationalities; d. To develop transparent, fair, affordable and independent dispute resolution mechanisms in accordance with the rule of law; e. To promote people centered development in land resources and accountable land use administration in order to support the equitable economic development of the country; f. To develop a National Land Law in order to implement the above objectives of the National Land Use Policy.
The Environmental Conservation Law (2012)	
The Pyidaungsu Hluttaw enacted this law by Law No. 9 of 2012 on the date of 30th March, 2012. March, 2012. The legal mechanism for ESHIA has been put in this law. This law was enacted with the objectives of: a. To enable to implement the Myanmar National Environmental Policy; b. To enable to lay down the basic principles and give guidance for systematic integration of the matters of environmental conservation in the sustainable development process; c. To enable to emerge a healthy and clean environment and to enable to conserve natural and cultural heritage for the benefit of present and future generations; d. To reclaim ecosystems as may be possible which are starting to degenerate and disappear; e. To enable to manage and implement for a decrease and loss of natural resources and for enabling the sustainable use beneficially; f. To enable to implement for promoting public awareness and cooperation in educational for dissemination of environmental perception; g. To enable to promote international, regional and bilateral cooperation in the matters of environmental conservation; h. To enable to cooperate with Government Departments, Government Organizations, International Organizations, non-government organizations and individuals in matters of environmental conservation. The following articles are particularly relevant to EIA requirements and this project: Article 7 of chapter 4 mentions the need for SIA and EIA for any project operated by the government or organizations or individuals. The duties and powers relating to the environmental conservation of the Ministry are as follows: a. Implementing the environmental conservation policies b. Laying down, carrying out and monitoring programs for conservation and enhancement of the environment and for conservation, control and abatement not to cause environmental pollution c. Specifying categories and classes of hazardous wastes generated from the production and use of chemicals or other hazardous substances in carrying out industry, agriculture, mineral production, sanitation and other activities; d. Prescribing categories of hazardous substances that may affect significantly at present or in the long run on the environment; e. Promoting and carrying out the establishment of necessary factories and stations for the treatment of solid wastes, effluents and emissions which contain toxic and hazardous substances; f. Prescribing the terms and conditions relating to effluent treatment in industrial estates and other necessary places and buildings and emissions of machines, vehicles and mechanisms;	

Laws and Regulations	Description
	g. Laying down and carry out a system of Environmental Impact Assessment (EIA) and Social Impact Assessment (SIA) as to whether or not a project or activity to be undertaken by any Government department, organization or person may cause a significant impact on the environment; h. Managing to cause the polluter to compensate for the environmental impact, cause to contribute funds by the organizations which obtain benefit from the natural environment service system, cause to contribute a part of the benefit from the businesses which explore, trade and use the natural resources in environmental conservation works.″ Also in this law, Article 14 and Article 15 are related to waste disposal in accordance with environmental standards: 14. A person causing a point source of pollution shall treat, emit, drainage and deposit the substances which cause pollution in the environment in accord with stipulated environmental quality standards. 15. The owner or occupier of any business, material or place which causes a point source of pollution shall install or use an on-site facility or controlling equipment in order to monitor, control, manage, reduce or eliminate environmental pollution. If it is impracticable, it shall be arranged to dispose the wastes in accord with environmentally sound methods. 16. A person or organization operating business in the industrial estate or business in the SEZ or category of business stipulated by the Ministry: a. is responsible to carry out by contributing the stipulated cash or kind in the relevant combined scheme for the environmental conservation including the management and treatment of waste; b. is responsible to carry out by contributing the stipulated cash or kind in the relevant combined scheme for the environmental conservation including the management and treatment of waste; c. shall contribute the stipulated users' charge s or management fees for the environmental conservation according to the relevant industrial estate, SEZ and business organization d. shall comply with the directives issued for environmental conservation according to the relevant industrial estate, SEZ or business.
Employment and Skill Development Law (2013)	
	Purpose: To ensure the job security and to develop the employee's skill with the fund of project owner: a. The project proponent has to appoint employees with the contract in line with the provision of section 5 of said law. b. The project proponent has to carry out the training programs with the policy of Skill Development Body to develop the employment skill of employees who is appointed or will be appointed, under section 14 of said law. c. The project proponent has to monthly pay to the fund, which is fund for development of skill of employees, not less below 0.5 percentage of the total payment to the level of worker supervisor and the workers below such level, under sub-section (a) of section 30 of said law. d. The project proponent has to promise not to deduct from the payment of employees for above mentioned fund, under sub-section (b) of section 30 of said law.
Minimum Wages Law (2013)	
	Purpose: To ensure the project owner pay the wages not less than prescribed wages and notify obviously this wages in work place, moreover to be inspected. a. The project proponent has to pay the wages in line with section 12 of said law. b. The project proponent has to notify the prescribed wages obviously in work place under sub-section

Laws and Regulations	Description
	(a) of section 13 of said law. c. The project proponent has to correctly record the lists, schedules, documents and wages and report these to the relevant department and give if these are asked while inspecting, in accord with the stipulations under sub-section (b)(c)(d) of section13 of said law. d. The project proponent has to allow to be inspected by the inspector, under sub-section (d) and (e) of section 13 and section 18 of said law. e. The project proponent has to allow holiday for medical treatment if the employee' health is not fit to work, under sub-section (f) of section 13 of said law. f. The project proponent has to allow holidays without deducting from the wages if one of parents or one of family dies, under sub-section (g) of section 13 of said law.
The Environmental Conservation Rules (2014)	
The Ministry of Environmental Conservation and Forestry, in the exercise of power conferred under sub-section (a) of section 42 of the Environmental Conservation Law, issues this rule by No. 50 of 2014 on the date of 5th June, 2014.	
Rule 51	The Ministry shall assign duty to the Department for enabling to adopt and carry out the environmental impact assessment system.
Rule 52	The Ministry shall determine the categories of plan, business or activity which shall carry out environmental impact assessment
Rule 53	The Ministry shall to scrutinize whether or not it is necessary to conduct environmental impact assessment, determine the proposed plans, businesses or activities which do not include in stipulation under rule 52
Rule 56	The person who carries out any project, business or activity shall arrange and carry out for conducting the environmental impact assessment for any project, business or activity of a qualified third person or organization accepted by the Ministry.
Rule 58	The Ministry shall form the Environmental Impact Assessment Report Review Body with the experts from the relevant Government departments, Government organizations.
Rule 61	The Ministry may approve and reply to the EIA report or IEE or EMP with the guidance of the Committee
Rule 69	i. Any person shall not emit, cause to emit, dispose, cause to dispose, pile and cause to pile, by any means, the pollutants and the hazardous waste or hazardous material stipulated by notification under the Law and any of these rules at any place which may affect the public directly or indirectly. ii. Any person shall not carry out to damage the ecosystem and the natural environment which is changing due to such system, except for carrying out with the permission of the Ministry for the interest of the people.
The Forest Law (1992)	
The State Law and Order Restoration Council had enacted the following Law in 3 November, 1992 as Forest Law.	
Chapter II: Basic Principles	3. This Law shall be implemented in accordance with the following basic principles: a) to implement the forestry policy of the Government; b) to implement the environmental conservation policy of the Government; c) to promote the sector of public co-operation in implementing the forestry policy and the environmental conservation policy of the Government.
Chapter IV: Management of Forest Land	9. The functions and responsibilities of the Forest Department are as follows:- a) implementation of the forestry policy of the Government; b) implementation of the plans relating to conservation of water, bio-diversity and environment, sustained yield of forest produce and protection of forest covered land;

Laws and Regulations	Description
	c) management of forest land in accordance with the provision of this Law; d) submitting proposals to the Minister for the determination, alteration or cancellation of reserved forest, protected public forest and species of reserved trees; Whoever, within a forest land and forest covered land at the disposal of the Government: a) is desirous of carrying out any development work or economic scheme shall obtain the prior approval of the Forestry Ministry.
Chapter XII: Offences and Penalties	40. Whoever commits any of the following acts shall, on conviction be punished with fine which may extend to Kyat 5,000 or with imprisonment for a term which may extend to 6months or with both: a) trespassing and encroaching in a reserved forest; b) pasturing domestic animals or permitting domestic animals to trespass in a reserved forest; c) breaking up any land, clearing, digging or causing damage to the original condition of the land without a permit in a reserved forest; d) causing damage to a water-course, poisoning in the water, using chemicals or explosives in the water in a reserved forest; e) catching animals, hunting or fishing in a reserved forest; f) kindling, keeping, carrying any fire or leaving any fire burning which may set fire to the forests in a reserved forest; h) violating any provision of the rule, procedure, order, directive or notification issued under this Law.
The Protection of Wildlife and Natural Areas Law (1994)	
The State Law and Order Restoration Council had enacted the Protection of wildlife and Natural Areas Law on 8th June, 1994.	
Objectives	The objectives of this Law are as follows:- a) to implement the Government policy for wildlife protection; b) to implement the Government policy for natural areas conservation; c) to carry out in accordance with the International Conventions acceded by the State in respect of the protection and conservation of wildlife, ecosystems and migratory birds; d) to protect endangered species of wildlife and their natural habitats.
Protected Wildlife	15. The Director General shall, with the approval of the Minister: a) determine and declare endangered species of wild animal which are to be protected according to the following categories: i. completely protected species of wild animals; ii. normally protected species of wild animals; iii. seasonally protected species of wild animals; b) determine and declare the endangered species of wild plants and their nature habitats thereof; c) lay down and carry out measures for the preservation of protected wildlife species;
Taking Administrative Action	31. A Forest Officer may pass an administrative order causing a fine that may extend to Kyat 10,000 to be paid, on a person who kills, hunts, wounds or raises a seasonally protected wild animal without permission during the closed season.
The Forest Law (2018)	
Purpose: To ensure in carrying out the project with the permission of Ministry of Natural Resources and Environmental Conservation if the project land is forest land or forest covered land. This law focuses as follow:	

Laws and Regulations	Description
a. The project proponent has to obtain the permission of Ministry of Natural Resources and Environmental Conservation before starting the work if the project land is forest land or forest covered under sub-section (a) of section 12.	
Protection of Biodiversity and Protected Area Law (2018)	
Purpose: To ensure abiding by the prohibitions and stipulations to protect biodiversity and protected area. a. The project proponent has to avoid entering the prohibited area located in protected area without permission under sub-section (a) of section35. b. The project proponent has to avoid digging on the land or carrying out any activity in protected area under sub-section (c) of section35. c. The project proponent has to avoid extracting, collecting or destroying in any manner, any kind of wild or cultivated plant in protected area under sub-section (d) of section35 d. The project proponent has to avoid polluting soil, water and air, damaging a water-course or poisoning water, electrification, using chemical or explosive materials in protected area under sub-section (a) of section39. e. The project proponent has to avoid possessing or disposing of toxic objectives or mineral wastes in protected area under sub-section (b) of section39.	
Public Health Law (1972)	
Purpose: to ensure the public health include not only employees but also resident people and cooperation with the authorized person or organization of health department. It is concerned with the protection of peoples' health by controlling the quality and cleanliness of food, drugs, environmental sanitation, epidemic diseases and regulation of private clinics. The project owner will cooperate with the authorized person or organization in line with the section 3 and 5 of said law. Section 3: The project owner will abide by any instruction or stipulation for public health. Section 5: The project owner will accept any inspection, anytime, anywhere if it is needed.	
Prevention and control of communicable Disease Law (1995)	
Purpose: to ensure the healthy work environment and prevention the communicable diseases by the cooperation with the relevant health department The project owner will cooperate with the health officer in line with the clause(9) of subsection(a) of section 3 of said law. The project owner will abide by any instruction or stipulation for public health. Section 4 The project owner will inform promptly to the nearest health department or hospital if the following are occurred; (section 9) (a) mass death of birds or chicken (b) mass death of mouse (c) suspense of occurring of communicable disease or occurring of communicable disease (d) occurring of communicable disease which must be informed The project owner will accept any inspection, anytime, anywhere if it is needed.(section 11)	
Mining Law (1994)	
Chapter II: Objectives	3. The objectives of this Law are as follows: a) to implement the Mineral Resources Policy of the Government; f) to protect the environmental conservation works that may have detrimental effects due to mining operation.
Chapter III: Application and Granting of Permit	4. A person or organization, desirous of carrying out any of the following operations, shall apply to the Ministry in accordance with the stipulations for obtaining permit 8. The Ministry may grant permit for the following operations: a) large scale production of industrial mineral or stone with local investment
Chapter IV:	12.The holder of permit shall:

Laws and Regulations	Description
Duties of the Holder of Permit	a) abide by the provisions of this Law, rules, orders and directives made there under; b) abide by the conditions contained in the permit; c) pay rent for the land related to the permit calculated in accordance with the rates prescribed by the rules made under this Law; d) pay rent for the land for each permit separately; 13. The holder of permit shall comply with the rules prescribed under this Law in respect of the following matters:- c) making provisions for safety and the prevention of accidents in a mine and their implementation; e) making provisions for the environmental conservation works that may have detrimental effects due to mining operation;
Chapter V: Right of Utilization of Land and Water for Mineral Production	15. If, in the interest of the State, it is necessary to acquire the land where mineral production could be undertaken on commercial scale, the Ministry shall co-ordinate with the relevant. Ministry for the acquisition of such land in accordance with the existing law. 16. If the holder of mineral production permit requires the use of public water for mineral production he shall first and foremost inform the Department of such requirement in accordance with the prescribed manner.
Chapter VI: Royalty	d) for industrial mineral or stone at the rate of 1% to 3%.
Chapter VII: Designation of Mineral Reserve Area and Gemstone Tract	21. The Ministry:- (a) may designate an area where mineral can be produced on commercial scale as Mineral Reserve Area by notification with the approval of the Government;
Chapter IX: Taking of Action by Administrative Means	28. If the holder of permit or a person managing on his behalf or any of the worker fails to comply with any of the orders or directives made under this Law, or contravenes any of the terms of the permit, the person issuing the permit may pass any of the following administrative orders:— a) suspending all or portion of the operations carried out under the permit; b) allowing continuation of the operation, after causing the payment of fine; c) cancelling the permit;
Social Security Law (2012)	
Purpose: The project proponent has to create the social security for the employees because the project is the business under the Myanmar Citizen Investment Law. To ensure the social security for employees of the project, the project owner has to register to the social security offices and to pay the prescribed fund. a. The project proponent has to register to the respected social security office, under sub-section (a) of section 11 of said law b. The project proponent has to pay the social security fund for at least four types of social security included in sub-section (a) of section 15, under section 15 of said law. c. The project proponent has to pay the fund which has to be paid myself and together with the fund which has to be paid from their salary by the employees .Moreover the project owner will pay the cost for paying the above mentioned fund only myself under sub-section (b) of section 18 of said law. d. The project proponent has to pay the fund for accidence, under sub-section(b) of section 48 of said law. (but this fund is not related to workmen compensation so if it is needed compensation must be separately paid by the Workmen compensation Act) **e.** The project proponent has to make correctly and submit the list and record provided in section 75 to respected social security office, under section 75 of said law.	

Laws and Regulations	Description
Myanmar Fire Services Law (2015)	
The objectives of Myanmar Fire Force Law are: a) To take precautionary and preventive measure and loss of state own property, private property, cultural heritage and the lives and property of public due to fire and other natural disasters b) To organize fire brigade systemically and to train the fire brigade c) To prevent from fire and to conduct release work when fire disaster, natural disaster, epidemic disease or any kind of certain danger occurs d) To educate, organize an inside extensively so as to achieve public corporation e) To participate if in need for national security, peace for the citizens and law and order The relevant Government Department or organization shall, for the purpose of precaution and prevention, obtain the approval of the Fire force Department before granting permission for the following cases: a) Constructing three-storied and above buildings market and condominium buildings, b) Operating hotel, motel, guest house enterprise c) Constructing factory, workshop, storage facilities and warehouse d) Operating business expose to fire hazard by using in inflammable materials or explosive materials e) Producing and selling fire-extinguishing apparatuses Doing transport business, public utility vehicles train, airplane, helicopter, vessel, ship, etc. The relevant government department or organization shall obtain the opinion of the Fire Services Department for the purpose of fire precaution and prevention, when laying down plans for construction for town, village and downtown or village development plans.	
Underground Water Act (1930)	
The underground water act enacted on the date of 21st June in 1930 whereas it is expedient to conserve and protect underground sources of water supply in the Union of Burma. This act prohibits sinking of a tube for the purpose of obtaining underground water except under and in accordance with the terms of a license granted by the water officer. Township Officer or sub-divisional officer had power to close a license tube after exercising jurisdiction over the local area concerned and the expense of such closure shall be recoverable from the owner of the tube as if it were an arrear of land-revenue.	
Farm Land Law (2012)	
To ensure the right to use the farm land and sufficient compensation for acquisition of the farmland. This law focuses the following matters; a. The project owner has to abide by the decision of relevant Ministry with the coordination with the Central Administrative Body of the Farmland for paying the compensation if it is needed acquisition farm land, under section 26 of said law. b. The project proponent has to obtain the permission of the Central Administrative Body of Farmland for the land use change from paddy field land to other land use under sub-section (a) of section 30. c. The project proponent has to obtain the permission of the Yangon Region Government with the recommendation of Yangon Region Administrative Body of Farmland for the land use change from farm land other than paddy field land to other land use under sub-section (b) of section 30.	
Vacant, Fallow and Virgin Land Management Law (2012)	
Purpose: To ensure the project land is clearly get as the project land. a. The project proponent will ensure to get permitted areas for the project land by the Central Administrative Body on Vacant, Virgin and Fallow Land, under sub-section (d) of section 10 of said law. b. The project proponent will promise to return the land if any antique object is found in the project area,	

Laws and Regulations	Description
	under sub-section (a) of section 19 of said law. c. The project proponent will promise to return the land if any resource is found in the project, under sub-section (d) of section 19 of said law.
The Settlement of Labor Dispute Law (2012)	
The Pyidaungsu Hluttaw hereby had enacted this Law for safeguarding the right of workers or having good relationship between employer and workers and making peaceful workplace or obtaining the rights fairly, rightfully and quickly by settling the dispute of employer and worker justly.	
Chapter II: Formation of the Workplace Coordinating Committee	
3. In any trade in which more than 30 workers are employed, the employer, with the view to negotiating and concluding collective agreement, shall: (a) if there is any labor organization, form the Workplace Coordinating Committee with the view to make a collective bargaining as follows: (i) two representatives of workers nominated by each of the labour organizations; (ii) an equivalent number of representatives of employer; (b) if there is no labor organization, form the Workplace Coordinating Committee as follows: (i) two representatives of workers elected by them; 5. The Coordinating Committee shall promote the good relationship between the employer and worker or labor organization, negotiation and coordination on the conditions of employment, terms and conditions and occupational safety, health, welfare and productivity. 6. (a) If the worker or labor organization or the employer, by themselves or by representative, request and complain their grievances to the Coordinating Committee, it shall be negotiated and settled by the Coordinating Committee within five days, not including the official holidays, from the day of the receipt of the request. (b) The Coordinating Committee shall keep the record of settlement and shall send report on the situation of performance in accord with the stipulation to the relevant Conciliation Body.	
Chapter III: Formation of the Conciliation Body	
10. The Region or State Government shall form the Conciliation Body in the townships.	
Chapter IV: Formation of the Dispute Settlement Arbitration Body	
16. (a) The Ministry shall, with the approval of the Union Government, form the Dispute Settlement Arbitration Body in the Regions or States.	
Chapter V: Formation of Dispute Settlement Arbitration Council	
19. The Ministry shall, with the approval of the Union Government, form the Dispute Settlement Arbitration Council with 15 qualified persons of good standing from legal experts and experts in labour affairs.	
Chapter VI: Settlement of Dispute	
23. A party, employer or worker, may complain individual dispute relating to his grievance to the Conciliation Body and if he is not satisfied with the conciliation of such body in accord with stipulated manners, may apply to the competent court in person or by the legal representative.	
International Guidelines	
In the following Guidelines and standards are referred for Environmental Management Plan of the proposed clay soil mining operation. a. World Health Organization Standards. b. National Environmental Quality (Emission) Guidelines (2015). The National Environmental Quality (Emission) Guidelines provide the basis for regulation and control of air emissions and liquid discharges from various sources in order to prevent pollution for the protection of human and ecosystem health. c. IFC Guidelines for Waste Management Facilities, 2007.	

CHAPTER 6
DESCRIPTION OF THE SURROUNDING ENVIRONMENTAL AND SOCIAL CONDITIONS

6.1 METHODOLOGY

The following are the methodologies used for the IEE report preparation;

i) On-site Measurements and Analysis – During the preparation phase, baseline parameters such as air quality, noise level, soil and water quality of the existing project site are measured and collected on site, while some water and soil samples were collected and tested in respective laboratories, and results are mentioned in this Chapter.
ii) Secondary Data Collection and Analysis – Some data, such as socioeconomic condition, the physical/biological environment and weather data are collected from official township data received from the Township Administrative Office.

6.2 PHYSICAL ENVIRONMENT

6.2.1 Climate and Rainfall

The climate is tropical as it is located in the low latitude zone and near the sea, therefore it experiences the typical wet and dry seasons, and rain is especially heavy in July and August. In 2016, total precipitation days was 115 days with average annual rainfall of 147.22 inches and the minimum temperature of 17°C and the maximum temperature of 37.5°C were recorded in winter and summer respectively. In 2017, total precipitation days was 116 days with average annual rainfall of 144.87 inches and the minimum temperature in winter was 17°C and the maximum temperature in summer was 37.5°C respectively. The project site also has tropical climate and therefore it experiences the typical wet and dry seasons.

6.2.2 Topography

Kyaikmaraw Township is one of the townships in Mon State located at the south-east part of Myanmar, adjacent to Mawlamyine, but it is largely rural. Its location is between 16° 7’ and 16° 34’ north latitudes and between 97° 9’ and 97° 50’ east longitudes, bordering Kawkareik Township in the east, Hpa-An township in the north and Kyarin Seikkyi township in the south, Kawkareik township and Mudon township in the west. The township is having an area of approximately 516.04 square mile with east- west extends of about 18 miles and a north-south extends of about 40 miles.

Kyaikmaraw Township is only 18 feet above sea level as it is in the low lying plains. The town looks like an oval shape frying pan situated between Jaing river basin on the north of the town, Taung Nyo mountain range on the west and Attaran river basin at middle-west. Attran is one of the famous rivers flowing from south to north across the town.

The project site is located in Mon State area, about 40km South-East from Mawlamyine and 8km South from Kyeikmaraw. It is located in Kyaikmaraw Township and Malkaro Village is situated near the project site. In its surrounding, Kaw Panaw, Kaw Dun and We Nge Villages are located respectively. The project location map is shown in Figure 6.1.

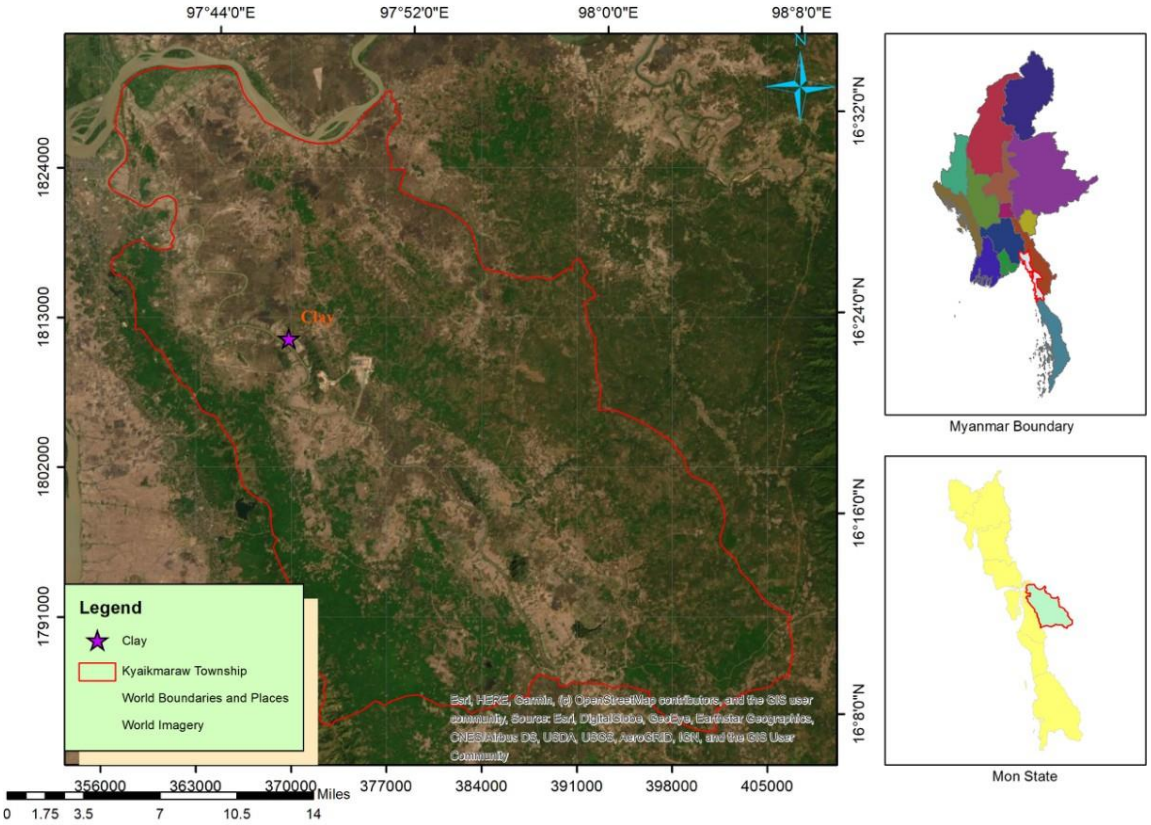


Figure 6. 1 Project Location

6.2.3 Hydrology

Kyaikmaraw Township is 18 ft above the sea level and is located adjacent to the Ataran River. The main rivers and streams in the area are Ataran River, Jaing River, Za Mi stream and Win Yaw stream. Ataran is one of the famous rivers in the region and is flowing from south to north across the town. Ataran and Jyine rivers are accessible by ships and boats. Most of the rivers and streams provide freshwater and can therefore be used both for agricultures and domestic uses.

6.2.4 Access and Transportation

The project site is always accessible by boat navigating the Ataran River from Kyaikmaraw, from which project site can be accessed by means of cars or motorcycles. It can also be accessed by car from Mawlamyine during the dry season by the car.

6.3 ENVIRONMENTAL QUALITY MEASURING

Baseline environmental parameters and sampling locations for air, noise, water, and soil quality measuring were defined according to the objectives of the environmental measuring purposes. Locations for sampling and analysis of ambient air, water, noise, and soil quality of the project site were identified by E Guard Environmental Services.

6.3.1 Ambient Air Quality

The emissions of dust particles and gases were measured for 24hrs continuously at the selected site within the project area by using the Environmental Perimeter Air Station (EPAS), AeroquaL S500 and EPAS provides direct readings in real time with data-logging capabilities. The measuring results were compared with National Environmental Quality (Emission) Guideline (NEQG), World Health Organization (WHO) and American Conference of Governmental Industrial Hygienists (ACGIH) guidelines.

Table 6. 1 Ambient Air Quality Parameters

Ambient Air Quality	
Gas Emission	SO_2, NO_2, O_3
Dust Emission	PM_{10}, $PM_{2.5}$

6.3.2 Ambient Noise

Noise level LAeq (dBA) will be measured at the selected location within the project area that can reflect the exposure of the nearest local community and sensitive locations. Duration and frequency were measured for 24hrs continuously at the selected site using the Noise Level Meter. The monitoring procedures, data analysis and interpretation were carried out in accordance with the instrument's manufacture and National Environmental Quality (Emission) Guidelines in order to be in line with Environmental Conservation Department, Ministry of Natural Resources and Environment Conservation (MONREC). "National Environmental Quality (Emission) Guidelines" for Myanmar was also presented the value of noise level as LAeq (dBA).

Table 6.2 Noise level monitoring

Noise monitoring	
Noise Emission	LAeq (dBA) (1hrs, 24 hrs.)

6.3.3 Water Quality

Surface water samples were collected at selected locations which are near irrigation scheme near project site and at Atran River with appropriate sampling equipment and procedures. The sampling team has pre-arranged with the labs in Yangon for analysis and logistic arrangement made to reach the preserved samples with unique IDs to the designated labs within 48hrs.

The sampling and survey team has a list of local laboratories providing analytical services for water quality analysis. Up to this date, there is no laboratory having accredited certification for water quality testing (environmental analysis) in Myanmar.

The following laboratories were used for analysis of water and parameters shown in **Table 6.3.**

1. ISO Lab, No-18, Lanthit Road, Insein Township, Yangon. Tel; 01 540 955, 732251575

2. SGS Minerals and Environmental Services, No. 79D, Bo Chain Street, 6-1/2Miles, Hlaing Township, Yangon. Tel; 01 654 795, 654 796

Table 6.3 Environmental Quality Parameters for Water Quality

Water Quality Parameter	
Chemical Parameter	BOD, COD
Physical Parameter	pH, Total Suspended Solid
Nutrients	Total Nitrogen, Total Phosphorous
Compounds	Oils & Grease
Biological	Total Coliform Bacteria

On-site water quality measurements, water samplings are conducted using the following equipment as shown in **Table 6.4.**

Table 6.4 Equipment for water sampling

Water Sampling Bottle	

6.3.4 Environmental Quality Measuring and Sampling Locations

Locations of sampling sites were discussed briefly by E Guard Environmental Services. Air quality and noise level monitoring were conducted at the selected locations within Clay soil production area. Surface water samples were collected near irrigation scheme near project site and at Atran River. Soil sampling was also conducted at the selected location within Clay soil Production Area.

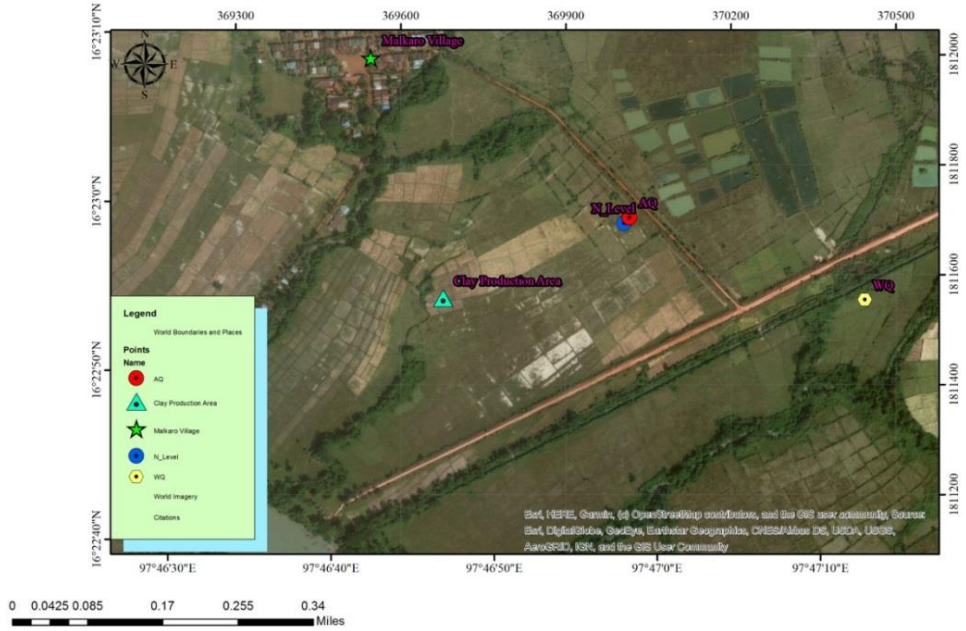


Figure 6. 2 Environmental Quality Monitoring Locations

Table 6.5 Location of Sampling Points

Locations No.	Points	Coordinate	Locations
Ambient Air Quality Monitoring Location			
1	Air	Lat- 16°22'59.21"N, Long- 97°46'58.16"E	Within project site
Noise Level Measuring Location			
1	Noise	Lat- 16°22'59.21"N, Long- 97°46'58.16"E	Within project site
Surface Water Quality Location			
1	Surface Water	Lat- 16°22'54.43"N, Long- 97°47'12.62"E	Irrigation Scheme near project site
2	Surface Water	Lat- 16°21'34.275"N, Long- 97°47'38.319"E	Atran River near project site
Soil Quality Sampling Location			
1	Soil	Lat- 16°23'27.579"N, Long- 97°49'14.670"E	Within project site

6.4 ENVIRONMENTAL QUALITY ANALYSIS

6.4.1 Ambient Air Quality

Air quality monitoring was done 24 hours at the selected location from 11 March 2019 to 12 March 2019. The measured results are compared with National Emission Guidelines.

There are many things, which are produced by humans and nature, those can pollute air quality. In general, they can be divided into two: Primary pollutants and Secondary pollutants. Primary pollutants are those that are produced directly into the air. The main

primary pollutants are particulate matters such as ash and smoke and gases such as SO_2, NO_2, and Ozone organic gases. Secondary pollutants are those that are produced from the chemical combination of primary pollutants and the chemicals contained in the normal air. They are NO_2, SO_2 and O_3, etc.

Emission Sources

Site clearing, topsoil removal, mine site preparation, mine production operation and closure may lead to the air quality degradation. Machinery operation, handling and transportation are the primary source of air pollutants and is the main factor that may cause impact on the environment and humans. Particulate matters and gases are produced from machinery operation and mine operations. Particulate matters ($PM_{10,}$ $PM_{2.5}$), NO_2, $SO_2$are measured at specific time interval for 24 hours by EPAS Haz-Scanner and O_3 is measured 8 hours by Aeroqua S500. The measured results are compared with the National Environmental Quality (Emission) Guidelines.

(a) Particulate Matters ($PM_{10,}$ $PM_{2.5}$)

Clay soil extraction and transportation may produce a lot of particulate matters into the surrounding air. Generated particulate matters are measured at the project site and the results are compared with NEQEG guideline in the following **Table 6.6.**

Table 6.6 The result of Particulate Matter (PM10 and PM2.5) compared with NEQ Guideline (24hrs. continuous)

Date	Time	Substance ($\mu g/m^3$)	Result ($\mu g/m^3$)	NEQ (Emission) Guidelines ($\mu g/m^3$)
11.March.2019 12.March.2019	StartTime11:00 End Time10:59	PM10 $\mu g/m^3$	37.20	50
		PM2.5$\mu g/m^3$	29.61	25

(b) Nitrogen Dioxide (NO_2)

Nitrogen dioxide is one of the main air pollutants and is generally produced from combustion. Machinery operation and generator usually produce the gas. In machinery operation case, although they are the source of air pollution, the produced gas type may differ based on the type of the engines such as diesel engine or petrol engine. Inhalation of nitrogen dioxide may lead to lung diseases. The result of nitrogen dioxide is shown in below **Table 6.7.**

Table 6.7 The result of Nitrogen Dioxide compared with NEQ Guideline (24hrs continuous)

Date	Time(1hr)	Substance (µg/m^3)	Result (µg/m^3)	NEQ Guidelines (µg/m^3)
11.March.2019 12.March.2019	StartTime11:00 End Time10:59	NO_2 (µg/m^3)	5.86 (µg/m^3)	200 µg/m^3

(c) Sulphur Dioxide (SO_2)

Sulphur dioxide is the most important gas among the air pollutants. It is colorless and has significant odor. Heavy machinery used in operation is the source of Sulphur dioxide. It may cause eye and throat irritation and respiratory tract problems when inhaled. Continuous amount may lead to lung diseases. The result is shown in below **Table 6.8.**

Table 6.8 The result of Sulphur Dioxide compared with NEQ Guideline (24 hrs continuous)

Date	Time(24hrs)	Substance (µg/m^3)	Result (µg/m^3)	NEQ (Emission) Guidelines (µg/m^3)
11.March.2019 12.March.2019	StartTime11:00 End Time10:59	SO_2 (µg/m^3)	2.62 (µg/m^3)	20 µg/m^3

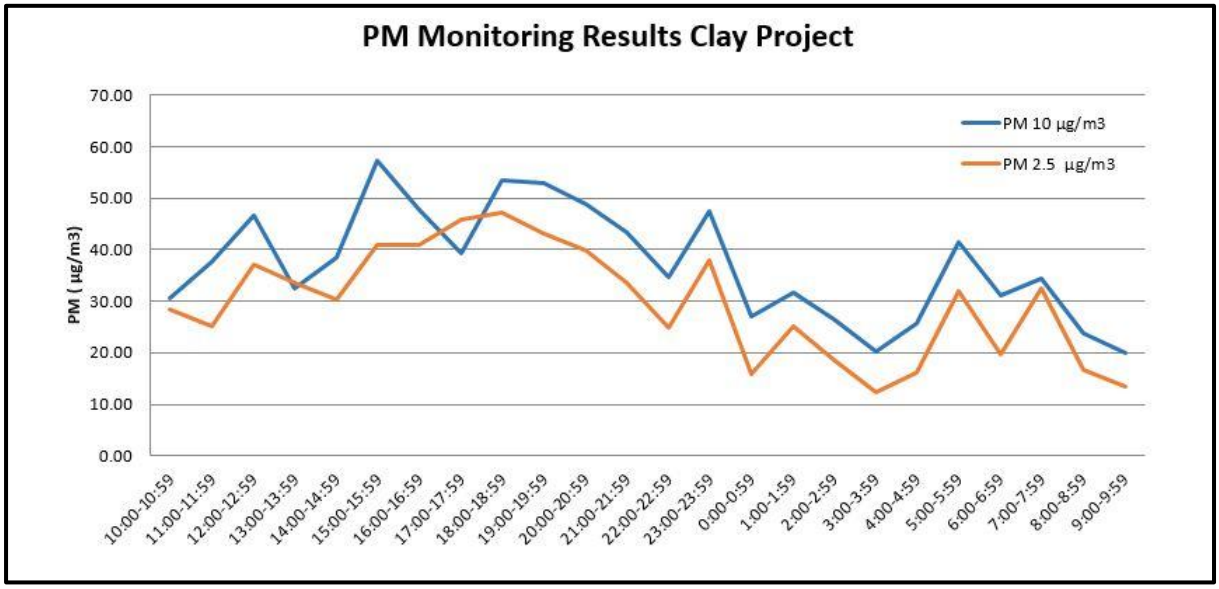


Figure 6.3 PM Monitoring Results at Project Site

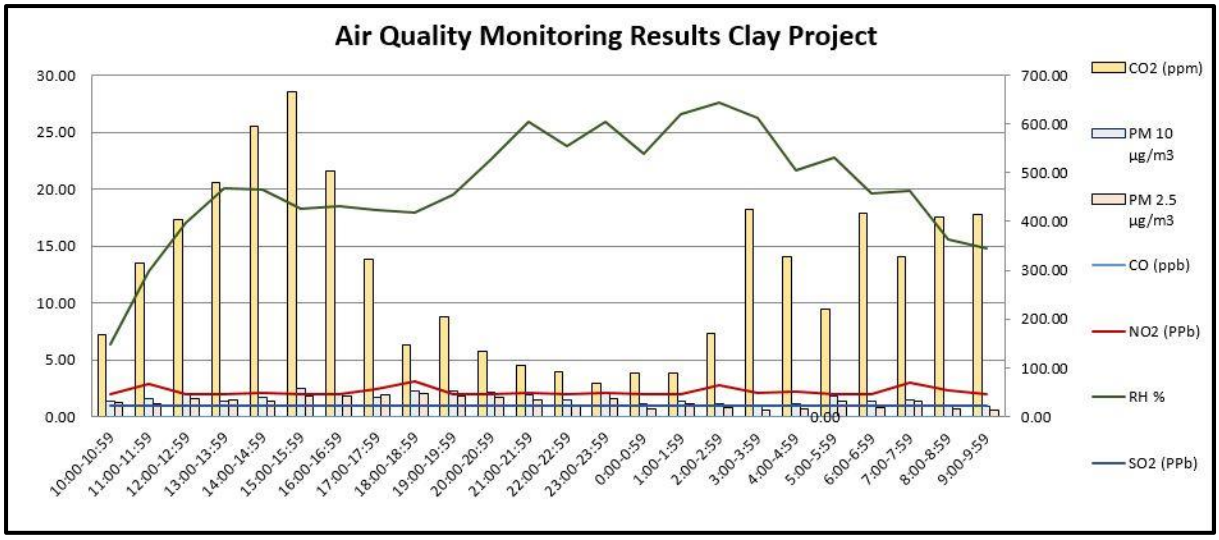


Figure 6.4 Fluctuation of Air Pollutants dial cycle at Project Site

(d) Ozone

Ozone is the most important gas among the air pollutants. It is a pale blue gas with a distinctively pungent smell. Pollution from cars comes from by-products of this combustion process (exhaust) and from evaporation of the fuel itself. It may cause shortness of breath, and pain when taking a deep breath. Cause coughing and sore or scratchy throat. Inflame and damage the airways. Aggravate lung diseases such as asthma, emphysema, and chronic bronchitis. The result is shown in below **Table 6.9.**

Table 6.9 The result of Ozone compared with NEQ Guideline (8 hrs continuous)

Date	Time(24hrs)	Substance (µg/m^3)	Result (µg/m^3)	NEQ (Emission) Guidelines (µg/m^3)
11.March.2019 12.March.2019	StartTime11:00 End Time10:59	O_3(µg/m^3)	110.319 (µg/m^3)	21 g/m^3

As per above tables, it can be seen that $PM_{2.5}$ parameters measured are upper the National Environmental Quality (Emission) Guideline (NEQG) because dust concentration is high during dry season. Ozone is upper the National Environmental Quality (Emission) Guideline (NEQG) because ozone level may be high during summer month. NO_2 and SO_2 are within the National Environmental Quality (Emission) Guideline (NEQG).

Figure 6.5 Air quality measure

Figure 6.6 Air and Wind Measurement

6.4.2 Ambient Noise

Ambient noise level for the proposed project was measured with Digital Sound Level Meter at the project site. The noise level measurement is conducted at one point near the air monitoring points on 11 March to 12 March 2019. Measuring period is 24 hours continuously. The following figures are noise level measurement at the proposed project.

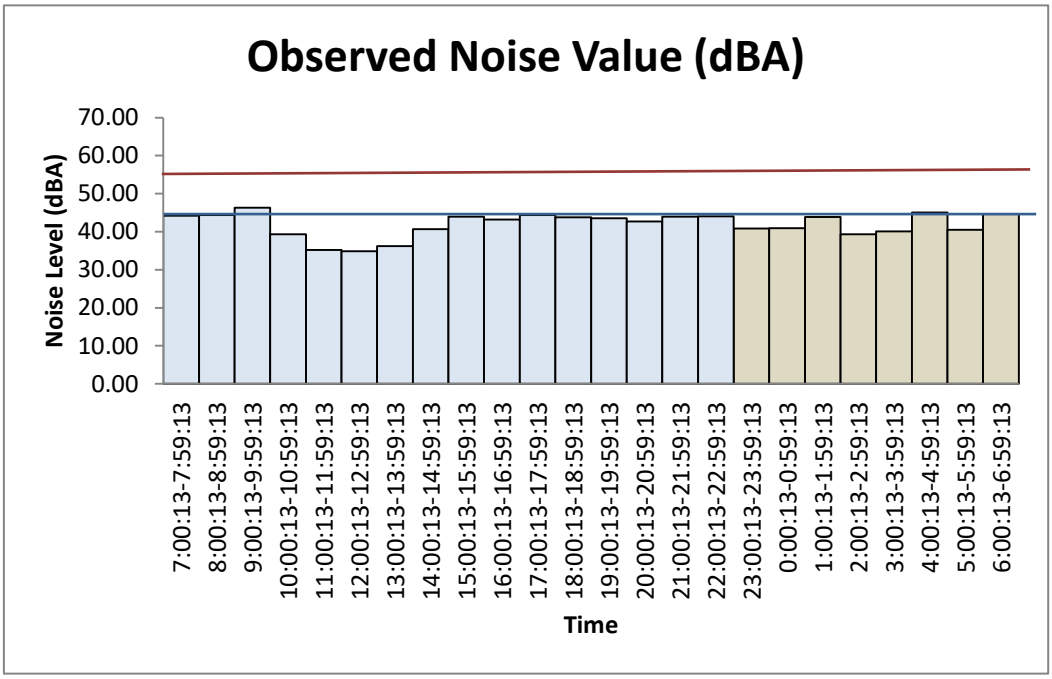


Figure 6.7 Noise Level at Clay soil

Table 6.10 National Environmental Quality (Emission) Guideline Value for Noise Level

Receptor	One Hour LAeq (dBA)	
	Day Time 07:00 – 22:00	Night time22:00 – 07:00
Residential, institutional, educational	55	45
Industrial, commercial	70	70

[a] Equivalent continuous sound level in decibels

Source: National Environmental Quality (Emission) Guidelines, 2015

Table 6. 11 Noise Level Measured within the Proposed Project

No.	Sources	Location	Date and Time	Day Time Average Noise Level (dB)A	Night Time Average Noise Level (dB)A
1.	Noise Source	Perimeter of the clay soil soil production area	11.3.2019 **Day time** (7:00 AM - 22:00 PM) **Night time** (22:00PM - 7:00 AM)	41.78	42.13
Weather was Fine ([a] Average; [b] Min; [c] Max)					

The observed values are compared with the National Environmental Quality (Emission) Guidelines as shown in **Table 6.10** which indicates the separate level for residential points.

The proposed project is located adjacent to the residential area. All the observed daytime and night time values are lower than the National Environmental Quality (Emission) Guidelines.

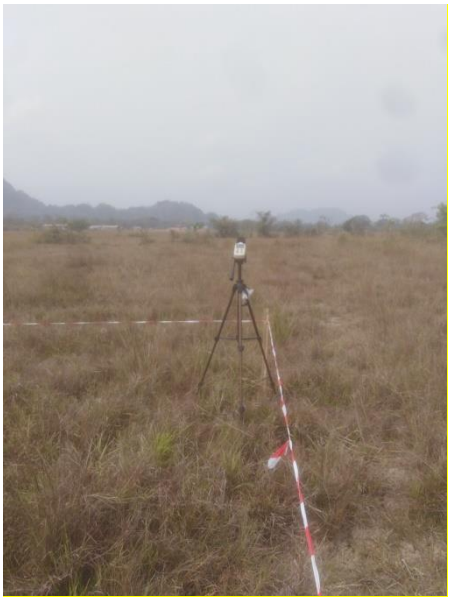


Figure 6.8 Noise quality measure

Figure 6.9 Noise quality measure

6.4.3 Wind Speed and Direction

The following figure describes the wind speed and wind direction of the proposed project site on, 11 March to 12 March 2019 respectively. According to the data, the wind is blowing from North to South direction expressed in the following figure.

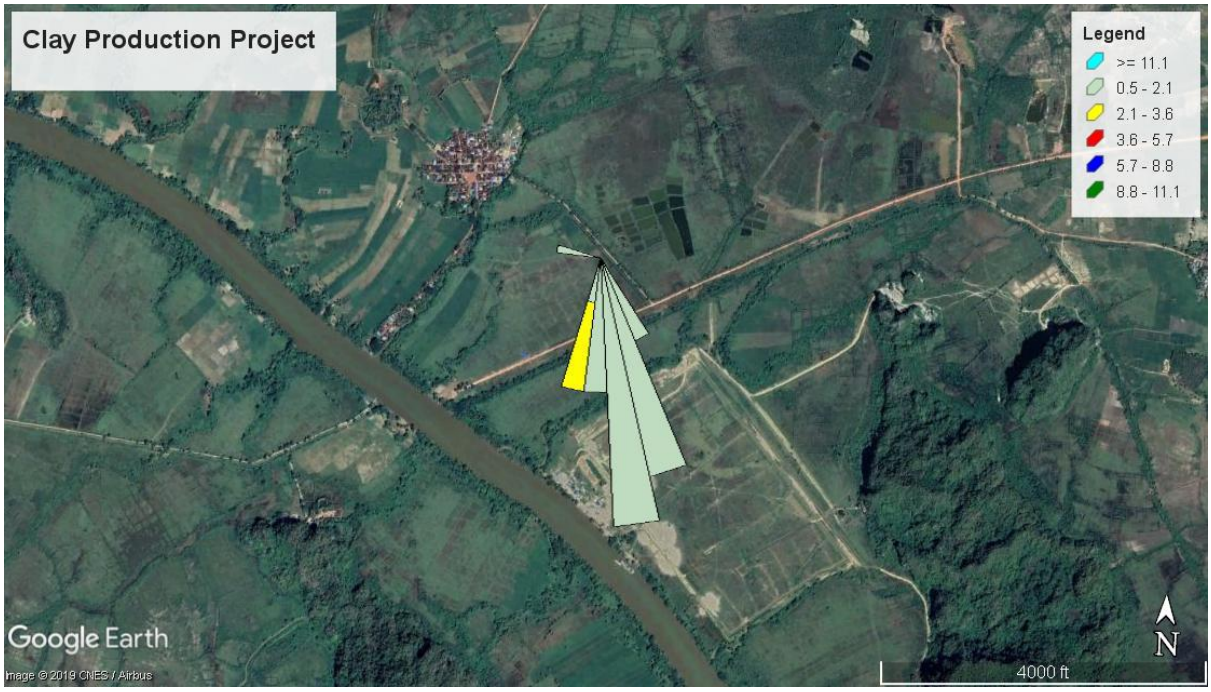


Figure 6.10 Wind Speed and Wind Direction (Blowing From) at Clay soil

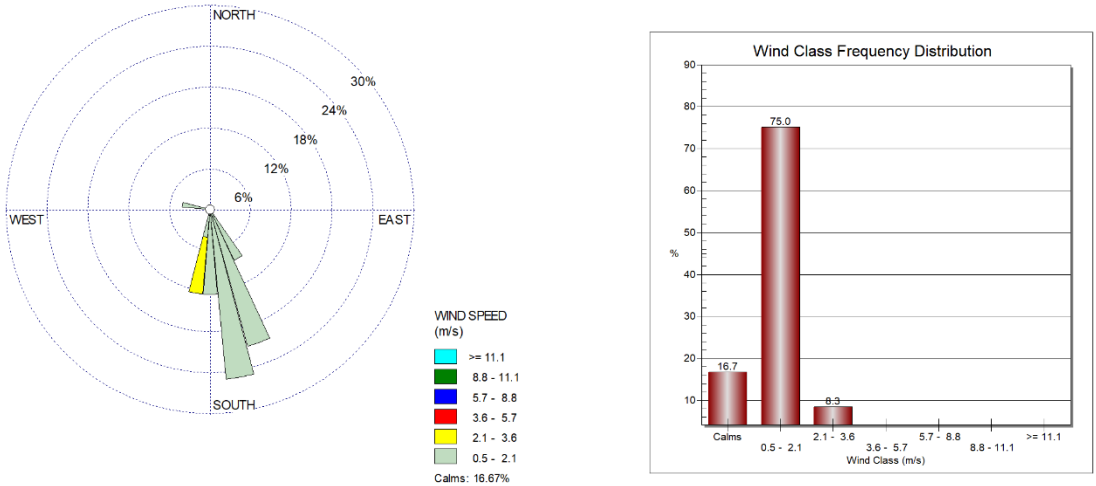


Figure 6.11 Wind Class Frequency Distribution at Clay soil

6.4.4 Water Quality

The project proponent is responsible for ensuring the drainage or runoff from the project or its related activities do not deteriorate the existing water quality. Baseline quality

of water quality was recorded by on site sampling and laboratory analysis at the selected location systematically. The field surveys for environmental quality sampling were done during 17 March 2019.

Objectives of the sampling and analysis of water quality is to understand the existing water quality at the selected locations and to monitor the impacts before the operation.

Water quality sampling results are shown in **Table 6.12** and compared with National Environmental Quality (Emission) Guidelines (NEQEG). According to the laboratory results, results of all parameters are within the NEQEG. Laboratory results of water quality can be seen in **Appendix 1 and 2.**

Table 6. 12 Surface Water Quality Results

Parameters	National Environmental Quality (Emission) Guidelines for General	Results
Agricultural drain near project site		
Biochemical Oxygen Demand (BOD) (5 days at 20 .C)	30 mg/l	8 mg/l
Chemical Oxygen Demand (COD)	125 mg/l	32 mg/l
Oil & Grease	10 mg/l	<5 mg/l
pH (Lab Results)	6-9 S.U.	7.2
Total Suspended Solids	50 mg/l	46 mg/l
Total Nitrogen	10 mg/l	<1 mg/l
Total Phosphorus	2 mg/l	<0.01 mg/l
Total Coliform Bacteria	400 CFU/100ml	4 CFU/100ml
Turbidity	5 NTU	81 NTU
Colour (True)	15 TCU	60 TCU
Atran River near project site		
Nitrate (N.NO3)	50 mg/l	0.3 mg/l
Dissolved Oxygen (DO)		5.4 mg/l
Biochemical Oxygen Demand (BOD) (5 days at 20 .C)	30 mg/l	16 mg/l
Turbidity	5 NTU	330 NTU
Colour (True)	15 TCU	120 TCU
pH (Lab Results)	6-9 S.U.	7.6
Salinity		0.1 ppt
Total Coliform Bacteria	400 CFU/100ml	18 CFU/100ml

Thermotolerant (Fecal) Coliform Count		4 CFU/100ml

Figure 6.12 Surface Water quality measure

6.4.5 Soil Quality

In Myanmar, there is still no government guideline for determination of background values of metals and metalloids in soil. Internationally, respective national guidelines use definition of natural background concentration in natural soil. The stepwise approach for deriving background values involves collection of data, statistical analysis of the data and determination of the background value. In this project, baseline soil sample was collected to understand the soil and sediment quality of existing conditions Analyzed results are shown in **Table 6.13**. The result of soil quality compared with FAO Guidelines. Soil quality result can be seen in **Appendix 3**.

Table 6. 13 Soil Quality Result

No.	Parameters	Project Site	FAO Guidelines
		Laboratory Finding (ppm)	Maximum Permitted Level (ppm) *
I	**Heavy Metal Contaminants**		
1.	Chromium (Cr)	53.9	**100**
2.	Cadmium (Cd)	ND	**0.8**
3.	Lead (pb)	38.6	**85**

No.	Parameters	Project Site	FAO Guidelines
		Laboratory Finding (ppm)	Maximum Permitted Level (ppm) *
4.	Arsenic (As)	31.1	**29**
5.	Irons (Fe)	88,312	**250**
6.	Mercury	ND	**0.5**
7.	Cyanide	-	**2**
II	**Micro Nutrients**		**Sufficient Level (ppm) ***
1.	Zinc (Zn)	127	**20-100**
2.	Copper (Cu)	37.8	**20-300**

Figure 6. 13 Soil quality measured

6.5 ECOSYSTEM

(a) Flora

Flora species usually found in Kyaikmaraw Township are Pyinkadoe, Padauk, Inn, Htaukkyunt, Pyinma, Thityinn, Lamu, Thinkhan, Thityar, Kokko, Latpan and Pauk according to the township data. The following table shows the recorded plant species which are referenced from EIA for June Cement Production Project.

Table 6. 14 Flora Species Found in Kyaikmaraw Township

Sr.	Common Name	Scientific Name	Family	Habitat
1	Bisat	*Chromolaena odorata*	Asteraceae	Shrub
2	Chin-baung	*Hibiscus surattensis*	Malvaceae	Shrub

3	Gway tauk	*Dregea volubilis*	Asclepiadaceae	Climber
4	Ha Kyoe (Mon)	Unknown-1	-	Tree
5	Ha Mine (Mon)	Unknown-2	-	Tree
6	Headache tree	*Premna serratifolia*	Lamiaceae	Shrub
7	Hnee War	*Bambusa burmanica*	Poaceae	Bamboo
8	Htan	*Borassus flabellifer*	Arecaceae	Tree
9	Hti-ga-yon-gale	*Neptunia javanica*	Mimosaceae	Aquatic
10	Ka Zai (Mon)	Unknown-3	-	Shrub
11	Kathit	*Erythrina arborescens*	Fabaceae	Tree
12	Kazun-galay	*Ipomoea aquatica*	Convolvulaceae	Climber
13	Kinmunchin	*Acacia concinna*	Mimosaceae	Climber
14	Kokko	*Albizia lebbek*	Mimosaceae	Tree
15	Kyaung-sha	*Oroxylum indicum*	Bignoniaceae	Tree
16	Kyee	*Barringtonia acutangula*	Lecythidaceae	Tree
17	Latpan	*Bombax ceiba*	Bombacaceae	Tree
18	Le lu	*Erythropalum scandens*	Olacaceae	Climber
19	Louk thay	*Tadehagi triquetrum*	Fabaceae	Shrub
20	Ma U	*Neolamarckia cadamba*	Rubiaceae	Tree
21	Malzali	*Senna timoriensis*	Caesalpiniaceae	Small tree
22	Mayan	*Bouea burmanica*	Anacardiaceae	Tree
23	Mhoe	*Agaricus* spp.	Agaricaceae	Fungi
24	Mon Daing	*Cycas siamensis*	Cycadaceae	Small tree
25	Myauk chaw	*Homalium tomentosum*	Flacourtiaceae	Tree
26	Naung	*Ficus* spp.	Moraceae	Tree
27	Ngar yanpatu	*Clerodendrum indicum*	Verbenaceae	Shrub
28	Nget pyaw	*Musa sapientum*	Musaceae	Herb
29	Nyan Pin	*Sesbania bispinosa*	Fabaceae	Shrub
30	Pain Ngel	*Artocarpus heterophyllus*	Moraceae	Tree
31	Panhtain ngo yeil	*Calanthe triplicata*	Orchidaceae	Herb
32	Phalan taung Way	*Costus speciosus*	Costaceae	Herb
33	Pyin Kado	*Xylia xylocarpa*	Mimosaceae	Tree
34	Pyin ma	*Lagerstroemia speciosa*	Lythraceae	Tree
35	Pyin taw thein	*Clausena excavata*	Rutaceae	Small tree
36	Sayyoe(Ohn nel)	*Streblus asper*	Moraceae	Small tree
37	Sin hna maung	*Heliotropium indicum*	Boraginaceae	Herb
38	Suboke	*Acacia intsia*	Mimosaceae	Climber
39	Taung Htan	*Livistona speciosa*	Arecaceae	Tree
40	Taung thale	*Garcinia cowa*	Hypericaceae	Tree
41	Taung Thapyay	*Tristaniopsis burmanica*	Myrtaceae	Tree

42	Taung war	*Asparagus sprengeri*	Asparagaceae	Shrub
43	Taw Durin	*Durio mansoni*	Bombacaceae	Tree
44	Taw sabai	*Jasminum rottlerianum*	Oleaceae	Climber
45	Taw Zi	*Ziziphus rugosa*	Rhamnaceae	Small tree
46	Taw-danyin	*Connarus paniculatus*	Connaraceae	Climber
47	Taw-nget-pyaw	*Musa laterita*	Musaceae	Herb
48	Tayok-saga	*Plumeria rubra*	Apocynaceae	Small tree
49	Tha pan	*Ficus glomerata*	Moraceae	Tree
50	Tha pyay	*Eugenia bracteolata*	Myrtaceae	Tree
51	Thabyu	*Dillenia indica*	Dilleniaceae	Tree
52	Thaing-kyein	*Calamus erectus*	Arecaceae	Climber
53	Thanat-kha-ayine	*Dracaena multiflora*	Asparagaceae	Tree
54	Thatyet phyu	*Mangifera caesia*	Anacardiaceae	Tree
55	Thayet	*Mangifera indica*	Anacardiaceae	Tree
56	Thin baw	*Carica papaya*	Caricaceae	Small tree
57	Thit phyu	*Albizia procera*	Fabaceae	Tree
58	Venus hair fern	*Adiantum capillus-veneris*	Pteridaceae	Fern
59	Wa U	*Amorphophallus paeoniifolius*	Araceae	Herb
60	War boe	*Dendrocalamus brandisii*	Poaceae	Bamboo
61	Yeyo	*Morinda angustifolia*	Rubiaceae	Small tree
62	Yone padi	*Hibiscus panduriformis*	Malvaceae	Shrub
63	Zi	*Ziziphus jujuba*	Rhamnaceae	Tree

Source: EIA report for June Cement Production Project

(b) Fauna

Wild boar, barking deer and monkeys are found in Kyaikmaraw Township according to the township data. The following table shows the recorded fauna species which are referenced from EIA for June Cement Production Project.

Table 6. 15 Fauna Species Found in Kyaikmaraw Township

No		Common Name	Scientific Name	IUCN
1	Mammals	Jungle Cat	*Felis chaus*	LC
2		Monkey	*Unidentified*	-
3		Rhesus Macaque	*Macaca mulatta*	LC
4		Pallas's Squirrel	*Calloscriurus erythreaus*	LC
5		Bumblebee Bats	*Craseonycteris thonglongyai*	LC
6		Geoffroy's Rousette	*Rousetttus amplexicaudatus*	LC

7	Birds	Jungle Crow	*Corvus macrorhynchos*	LC/R
8		Pigeon	*Columba livia*	LC/R
9		Common Swift	*Apus* sp.	LC/R
10		Common Myna	*Acridotheres tristis*	LC/R
11		Black-capped bulbul	*Pycnonotus melanicterus*	LC/R
12		Spotted Dove	*Spilopelia chinensis*	LC/R
13		Green-billed malkoha	*Phaenicophaeus tristis*	LC/R
14		Asian openbill	*Anastomus oscitans*	LC/R
15		Mountain tailorbird	*Phyllergates cucullatus*	LC/R
16		Crow Pheasant	*Centropus sinensis*	LC/R
17		Black-headed bulbul	*Pycnonotus atriceps*	LC/R
18		Indian roller	*Coracias benghalensis*	LC/R
19		Fulvous whistling duck	*Dendrocygna javanica*	LC/R
20		Black Bulbul	*Hypsipetes sp.*	LC/R M
21		Common Weaver	*Ploceus hypoxanthus*	LC/R
22		Oriental magpie robin	*Cosychus saularis*	LC/R
23	Reptiles	Python	*Python bivittatus*	VU
24		Viper	*Montivipera xanthine*	VU
25		Common Garden Lizard	*Calotes mystaceus*	LC
26		Cobra	*Ophiophagus hannah*	VU
27		Gecko	*Cyrlodactylus pulchellus*	LC
28	Crustaceans	Snail	*Ashmunella sp.*	NT
29		Giant River Prawn	*Machrobrachium rosenbergil*	LC
30		Golden apple snail	*Pomacea canaliculata*	LC
31		Shrimp	*Peneaus sp.*	NE
32		Freshwater Crab	*Somanniathelphusa spp.*	DD
33	Amphibians	Common Toad	*Duttaphrynus melanostictus*	LC
34		Frog	*Fejervarya* sp.	LC

35	Fishes	Paradise threadfin	*Polynemus paradiseus*	NE
36		Croaker	*Johnius macropterus*	NE
37		Hilsa Shad	*Tenualosa ilisha*	NT
38		Tropical two-wing flyingfish	*Exocoetus volitans*	LC
39		Snakehead Murrel	*Chanana striata*	NE
40		Walking Catfish	*Clarias batrachus*	LC
41		Swanp Barb	*Puntius chola*	LC
42		Colorful Eel	*Mastacembelus unicolor*	NE
43		Perch	*Anabas testudineus*	DD
44		Featherback	*Notopterus notopterus*	LC
45		Nile Tilapia	*Oreochromis niloticus*	LC
46		Murrel	*Chana sp.*	NE
47		Stripted Dwarf Catfish	*Mystus mystus*	NE
48		Wallago	*Wallago attu*	NT
49	Insects	Leopard or spotted rustic	Phalanta phalantha	NE
50		Common tiger	Danaus genutia	NE
51		Common grass yellow	Eurema hecabe	NE
52		Black stream glide	Trithemis festiva	LC
53		Slender skimmer	Orthetrum sabina	LC
54		Common crow	Euploea core godarti	NE
55		Brown argus	Aricia agestis	NE
56		Great Mormon	Papilio memnon agenor	NE
57		Clipper	Parthenos Sylvia apicalis	NE
58		Common Mormon	Papilio polytes romulus cramer	NE
59		Common Mormon	Eurema pallida	NE
60		Pied paddy skimmer	Neurothemis tullia	LC
61		Crimson-tailed marsh hawk	Orthetrum pruinosum	LC
62		The plain tiger	Danaus chrysippus	NE
63		Dragonfly	Potamarcha congener	LC

64		Pond Skaters	Gerridae	NE
65		Locust	Locusta migratoria	LC
66		Common Green Grasshopper	Omocestus viridulus	NE
67		Butterfly	Unidentified	-
68		Spider	Unidentified	-
69		Common red soldier beetle	Rhagonycha sp.	NE
70		Bug	Chrysomela sp.	NE
71		Wasp	Dolichovespula spp.	NE
72		Seven-spot ladybird	Coccinella septempunctata	NE
73		Antlion Lava	Distoleon tetragrammicus	NE
74		Fruhstorfer	Cethosia cyane euanthes	NE
75		Small Dragonfly	Brachythemis contaminatea	LC

NE: Not Evaluate; **DD**: Data deficiency; **LC**: Least Concern; VU: Vulnerable; **NT**: Near Threatened
Source: EIA report for June Cement Production Project

(c) Cultural Heritages

There is no cultural heritage site in the project area.

(d) Environmental Condition

Kyaikmaraw Township has 22.04% of total forest coverage and all of them are reserved forest area. There is no protected public forest in the township.

(e) Environmental Conservation Works

For environmental conservation, total area of 72804.88 acres has been established as the reserved forest area. Currently, there is no protected public forest and total forest plantation area for hard wood is 11 acres.

(f) Natural Disasters

Kyaikmaraw Township usually encountered flood in rainy season, especially in heavy raining condition. As a record, no natural disasters such as storm, tsunami, earthquake, fire, have been recorded in Kyaikmaraw Township up to September, 2017.

Source: General Administration Department Kyaikmaraw township data (2017)

6.6 SOCIAL ENVIRONMENT

(a) Economic Overview

Kyaikmaraw Township is located in Mon State, Thanintharyi Division and is one of the little undeveloped townships. Agriculture is the main business in the township. From

Kyaikmaraw, Mawlamyine, Mudon, Kawkareik and Kyainseikgyi regions are accessible by land and sea routes and therefore has the good communication network. Rubber is the main product of the region and is mainly exported to Mawlamyine and Mudon.

(b) Ethnic Groups

The followings are the record of ethnic groups living in Kyaikmaraw Township.

Table 6.16 Ethnic Groups Living in Kyaikmaraw Township

No.	Races	Populations	Township population	Percent of total township population
1	Kachin	-	-	-
2	Kayar	-	-	-
3	Kayin	45558	45558	20%
4	Chin	5	5	0.01%
5	Mon	106978	106978	48.18%
6	Myanmar	28377	28377	13.23%
7	Rakhine	35	35	0.02%
8	Shan	1120	1120	0.47%
9	PaOo	-	-	-
10	Others	39970	39970	19.01%
11	Pakistan	2	2	0.01%
Total		222091	222091	101%

Source: General Administration Department Kyaikmaraw township data (2017)

(c) Households, Families and Populations

Total populations of Kyaikmaraw Township up to September, 2017 are shown in the following tables.

Table 6.17 Total Households/ Families of Kyaikmaraw Township

No	Description	Households	Families	Ward	Village Groups	Village
1	Urban	2102	2120	2	43	164
2	Rural	33515	35717	2	43	164
Total		35617	37837	2	43	164

Source: General Administration Department Kyaikmaraw township data (2017)

Table 6.18 Total Populations of Kyaikmaraw Township

No	Description	Over 18 years old			Under 18 years old			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
1	Urban	4308	4628	8936	1967	1952	3919	6275	6580	12855
2	Rural	62814	66685	129499	39581	40156	79737	102395	106841	209236
Total		67122	70313	138435	41548	42108	83656	108670	113421	222091

Source: General Administration Department Kyaikmaraw township data (2017)

(d) Forest

Table 6.19 Forests in Kyaikmaraw Township

No	Description	Area (acres)	Plants
1	Reserved Forest	72623.30	Pyinkadoe, Inn, Yaymein, Myayar, Didu, Zinpyon, Nabae, Sits
2	Protected Public Forest	-	-
Total		72623.30	-

Source: General Administration Department Kyaikmaraw township data (2017)

(e) Forest Products

Table 6.20 Forest Products of Kyaikmaraw Township

No	Type	Unit	Production
1	Firewood	Cubic Tons	430
2	Bamboo	Unit	34000

Source: General Administration Department Kyaikmaraw township data (2017)

(f) Mineral Production

Information about mineral production in Kyaikmaraw Township is shown as below.

Table 6.21 Mineral Production of Kyaikmaraw Township

No	Mineral Type	Location	Amount (Sud)	Cost (in millions)
1	Cobble-stone	Kun Ngan village	4400	11000
2	Cobble-stone	Nga Pu Inn village	1600	4000
3	Cobble-stone	Kaw Pa Naw village	1100	2750
4	Cobble-stone	Hpar Thein village	700	1750
Total			7800	19500

Source: General Administration Department Kyaikmaraw township data (2017)

(g) Land use

Different types of land use in Kyaikmaraw Township can be submitted as follows;

Table 6. 22Types of Land Use in Kyaikmaraw Township

No.	Types of Land	Area (acre)
1.	**Net acre for plantation**	144589
	(i) Farmland	52853
	(ii) Orchard	91736
2.	**Vacant Land Area**	51708
	(i) Farmland	51708
3.	Pasture Land	8005
4.	Land for industrial zone	1492
5.	Urban Lands	2912
6.	Village Lands	9076
7.	Other Lands	3071
8.	Reserved forest and protected forest area	72602
9.	Wild forest	6569
10.	Wild land	11544
11.	Area not to be cultivated	40482
Total		**327494**

Source: General Administration Department Kyaikmaraw township data (2017)

6.7 SOCIAL-ECONOMIC SURVEY RESULTS

E Guard's IEE study team interviewed three villages (Malkaro, KawPaNaw and Kaw Don) located near the proposed project. Most of the local people are migrated workers for their livelihood. Most of the people in KawPaNaw and Kaw Don are used purified water and tube well water. In Malgaro village, tube well water is used for their drinking and domestic water. In KawPaNaw and Kaw Don Village leaders also said transportation is good. In Malkaro, village leader said transportation is very difficult in during rainy season. They said that, transportation, education, economic health conditions and job opportunity may develop due to the proposed project. If June Cement Production Project use coal as fuel for cement production process, local people are worried about environmental pollution may be occurred.

CHAPTER 7

IDENTIFICATION AND ASSESSMENT OF POTENTIAL ENVIRONMENTAL IMPACTS

7.1 IDENTIFICATION AND ASSESSMENT OF POTENTIAL ENVIRONMENTAL IMPACTS

Based on the analysis of environmental baseline information and activities that are to be performed by the project, the possible environmental impacts are identified. The development of the project will bring changes in the local environment in terms of physical, biological and socio-economic aspects. There may be some positive and negative impacts in the surrounding environment of the project. The potential impacts are identified in terms of each environmental issue, likely impacts during preparation, operation and decommissioning/ closure phases. The potential impacts from various activities of the project can be categorized as shown in **Figure 7.1.**

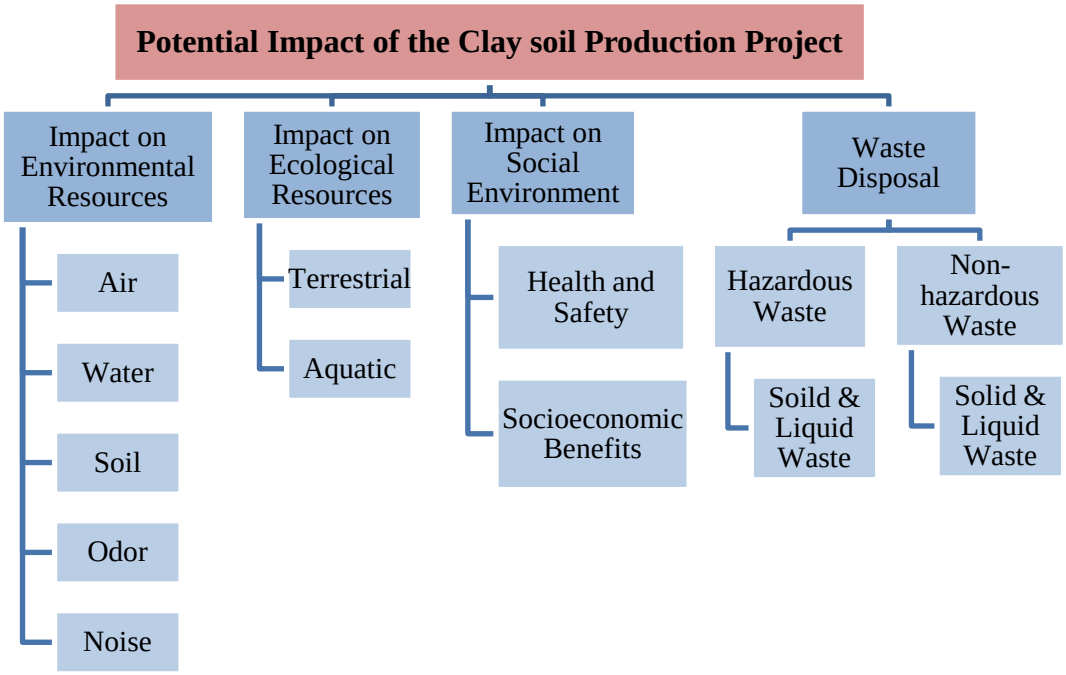


Figure 7. 1 Potential Impact of the Proposed Project

7.2 OBJECTIVE

The main objective of this study is to assess the impacts of mining on local livelihoods and the environments within Kaw Pa Naw Village and Malkaro Village tracts and to assess the environmental impacts of clay soil production operation.

7.3 PHASES OF CLAY SOIL PRODUCTION PROJECT

There are different phases of clay soil production project, beginning with mineral ore exploration and ending with the post-closure period. Each phase of clay soil mining is associated with different sets of environmental impacts. Potential impacts have been separated three main types based on different phases of development, i.e. Preparation phase, Operation phase and Decommissioning/Closure phase.

Preparation Phase: This phase will include site preparation, construction of temporary camps, workshop, water storage tank, kitchen, toilets and other related activities.

Operation Phase: During the operation phase the following will be conducted:

- Operation and maintenance of vehicles, heavy equipment and generators;
- Extraction, Excavations, transportation of materials; and
- Topsoil stockpile.

Decommissioning Phase: This phase related activities would require the use of the demolishing equipment. Where needed, any existing hazardous materials used in decommissioning would be properly handled and disposed of in accordance with governing authority requirements. Tentative schedule for clay soil mining operation is shown in **Table 7.1**.

Table 7. 1 Tentative Schedule for clay soil Mining Operation Activities

Phases	Activities	Years											
		2 yrs	30 yrs										1 yr
Preparation Phase	Land Clearing and Topsoil Removal												
Operation Phase	Excavation												
	Transportation to the cement plant												
Demolishing/Closure Phase	Demolishing the Clay soil Mining Associated Materials												
	Rehabilitation												

7.4 METHODOLOGY & APPROACH FOR IMPACT ASSESSMENT

The assessment of each impact is based on consideration of four parameters: magnitude, duration, extent and probability of activities, which are going to be carried out during three phases and characteristics of the project site.

The following methodology has been applied to assess the environmental impacts of the clay soil mining operation mainly on air, water, soil and etc. Each assess point has 5 scales as mentioned in the **Table 7.2**.

Table 7.2 Impact Assessment Parameters and Its Scale

Assessment	Scale				
	1	2	3	4	5
Magnitude (M)	Insignificant	Small and will have no effect on the environment	Moderatea nd will result in minor changes in the environment	High and will result insignificant changes on environment	Very high And will result in permanent changes on environment
Duration(D)	0-1year	2-5year	6-15year	Longer than 15 year	Permanent
Extent(E)	Limited to the site	Limited to the local area	Limited to the region	National	International
Probability(P)	Very improbable	Improbable	Probable	Highly probable	Definite

Then, the significant point (SP) is calculated by following formula.

Significant Point (SP) = (Magnitude+ Duration+ Extent)*Probability

Based on calculated significant point, impacts significance can be categorized as follows:

Table 7. 3 Impact Significance

Significant Point (SP)	Impact Significance
<15	Very low
15-29	Low
30-44	Moderate
45-59	High
<60	Very High

According to the assessment methodology, very low and low significance impacts can be regarded as negligible impact to the environment, in which there is no significant impact on the environment.

However, moderate impact can have little effect on the environment. So, some mitigation measures must be considered. High impact can have significant changes in the environment. Therefore, mitigation measures must be done. Very high impact can be permanent changes in the environment. To reduce and control the impacts and disadvantages on the environment, mitigation measures must be performed.

7.5 POTENTIAL ENVIRONMENTAL IMPACTS IDENTIFICATION AND ASSESSMENT

The proposed clay soil mining project is the extraction of clay soil. Mining operations involve development of benches, approach roads, haul roads, excavation and handling & transportation of clay soil. It is associated with a number of environmental impacts, which are

land degradation, open cast which may serve as the animal traps and may pose health hazards, water pollution, soil pollution, dust and noise pollution. The likely effects of the proposed project activities are:

1. Land degradation;
2. Visual intrusion of land;
3. Fugitive dust generation;
4. Higher run-off during rains;
5. Higher noise and vibration levels; and
6. Human health risks.

The haulage of clay soil within the mining area will lead to emissions of fugitive dust and higher noise levels in the mining area and surrounding village. These operations generally result in generation of dust and higher noise levels and there by pose health hazards. Proposed open cast mine will result in disturbance of the land use pattern of the Area and cutting of benches will result in higher chance of erosion effects due to surface run-off during heavy rainfall. Storage and handling of fuel oils, lubricating oil and grease, are areas of concern from environmental, health and safety point of view. Vehicle and equipment maintenance would generate waste oils; oil and grease and suspended particle. Mine office and worker camps will also mainly contribute towards solid waste and sanitary wastewater.

7.5.1 Impact on Aesthetics resources

Preparation, Operation and Decommissioning/Closure Phase

Throughout the lifespan of clay soil mining, sources of visual impact and their impact will be clearly varied and this needs to be considered and properly addressed at the outset. In addition, due to excavation activities permanent landscape change may occur and therefore long-term visual modification of the landscape must be considered. The clay soil mine project can affect surrounding landscapes and natural landmarks. Potential impacts include:

- Complete destruction of the resource through surface disturbance or excavation;
- Degradation or destruction, due to topography or hydrological pattern changes or from soil movement (removal, erosion, sedimentation); and
- Visual impacts due to clearing of vegetation, large excavations and vehicles.

7.5.2 Impacts on Air Quality

Preparation Phase: During these phases, there can be particulate matter, nitrogen dioxide, carbon dioxide, Ozone and Sulphur dioxide emissions from activities such as operation and maintenance of vehicles, any on-site power generation facilities, site preparation and other related activities. Gas emissions may occur from the combustion of fuels in temporary camps and mobile sources. In addition, potential sources of dust and gaseous emissions during the preparation phase include:

- Land clearance and preparation;
- Heavy vehicle operation;
- Topsoil loading, unloading, transportation and storage;
- Access road preparation; and

- Power generation and general vehicle use.

Operation Phase: During these phases, fugitive dust in the clay soil mining site may be generated from exposed surface such as haul roads and infrastructure and to a lesser extent, gases from combustion of fuels in mobile equipment. Operation of vehicles and generators can also lead to releases of airborne of greenhouse gases and various air contaminants, including sulphur oxides, nitrogen oxide and particulate matter. Open cast topsoil stockpiles are potential sources of windblown particulate matter. In addition, operational activities that may affect the air quality (dust and gas) include;

- Earth moving equipment (backhoes);
- Top soil stripping, transportation and storage;
- Land clearing and road grading;
- Fuel burning in heavy equipment and vehicles;
- Fugitive emissions through use of oils and greases;

Dust and other particulate matters can cause breathing problems for people, especially very small dust particles. Dust can also contain metals and other contaminants which can also cause health problems.

Decommissioning/Closure Phase: During these phases, operation of vehicles, operation of decommission machineries and equipment can also lead to releases of airborne greenhouse gases and various air contaminants, including sulfur oxides, nitrogen oxide and particulate matter. Large quantities of dust will generate during the demolition phase. This will affect the workers engaged in the demolition process.

7.5.3 Odor

Preparation, Operation and Decommission/Closure Phases

Fuel from vehicles and diesel generators will be one of the main sources of odor emissions at the clay soil mining site.

7.5.4 Impacts on Noise and Vibration

Preparation Phase: During the preparation phase, major sources of noise and vibration may include noise and vibration from vehicle engines, power generation and other sources related to preparation activities. Moreover, noise and vibration could be generated from vehicles used for transportation of preparation materials and other preparation machineries and equipment such as hydraulic excavator, generator and etc.

Operation Phase: During the operation phase, the key issues related to noise and vibration is concerned with ongoing excavation of soils involving earth moving equipment operation (hydraulic excavator). The most significant noise and vibration include:

- Material handling equipment and operations;
- Mining equipment operation
- Other internal combustion engine powered equipment; and
- Vehicles operations;

Decommissioning/Closure Phase: The decommission phase will generally involve less noise and vibration generation due to the absence of operational equipment. Much of the area will be reclaimed by covering with soil, involving limited use of earth moving equipment.

7.5.5 Impacts on Soil Quality and Terrestrial Ecosystem

Preparation Phase: During the preparation phase, soil erosion may be caused by exposure of soil surfaces to rain and wind during site cleaning, earth moving, excavation activities and heavy and prolonged rainfall. In addition, degradation and loss of topsoil can be occurred due to the removal and compaction of soil, working activities, and open areas. In addition, site clearing activities, excavation works and preparation activities will cause loss of soil quality in the clay soil mining site. The removal of topsoil from the mine site is exposed the soil and therefore change the original soil texture and structure. The leveling the mine site during the preparation can impact the terrestrial ecosystem of the mine site depending on the condition of the existing vegetation. The most obvious impact to biodiversity from mining is the removal of vegetation, which in turn alters the availability of food and shelter for wildlife. Forests are the most biologically diverse terrestrial ecosystems. The key direct impact of mining on forest ecosystem is the removal of vegetation and canopy cover. Indirect impacts include road building development, which may result in habitat fragmentation and increased access to remote areas.

Operation Phase: During the operation phase, topsoil that will remove and kept for later re-use in reclaiming the site should be taken in care not to affect the mine site and environment. The major effect of clay soil mining activity in the project area is soil erosion. Erosion is caused by land disturbances and removal of vegetation in the process of clay soil mining. Spills or leakages from machineries, vehicles and fuel storage area can happen due to improper handling or disposal that can cause soil contamination. Destruction of the habits is the main component of biodiversity losses, but direct poisoning caused by mine-extracted materials and indirect poisoning through food and water, can also affect animals, vegetables and micro-organisms.

Decommissioning/ Closure Phase: During this phase, other mine facilities will be reclaimed by covering with topsoil at the proposed mine site. There will be some localized reclamation of disturbed sites, including re-grading, re-contouring and rehabilitation, thereby reducing potential erosion.

7.5.6 Impacts on Water Quality and Aquatic Ecosystem

Preparation Phase: The removal of top soil during preparation may affect the quality of surface water recharging of an aquifer. In the project area, potential contamination of water sources may occur early in the mine site during the preparation stage. The removal of trees and other vegetation and level the mine site during the preparation phase can lead to problems with sedimentation in nearby water bodies due to releases of suspended solid in surface water runoff. In addition, potential sources of water quality and aquatic ecosystems during the preparation phase include:

- Operation and maintenance of vehicles;
- Leaks from on-site power generation facilities;
- Spillage of fuel transportation, handling and storage;
- Site preparation and construction activities;
- Sewage and wastewater disposal; and

Operation Phase: The potential impact on the surface water quality is likely to be due to higher load of suspended solids. Sources of suspended solids would be:

- Mine runoff and Wash off from topsoil stock piles;
- Oil spillage from vehicle maintenance; and
- Domestic Effluent and sewage;

Operational activities that may affect water levels and quality include;

- Discharged water from dewatering process in both operation and rainy season when the project activities under steady state.
- Clearing land form for operational purpose;
- Storage and use of hazardous materials (oil and etc.) on site.

Decommissioning/Closure Phase: Demolition activities during monsoon season or rainy periods will produce wastewater generated from workers and staffs, and leakage of oil and grease from vehicles and demolished machines.

7.5.7 Waste Generation

7.5.7.1 Solid Waste

Preparation Phase: The waste includes excavated materials from the earthworks and other non-hazardous solid wastes from the preparation activities. Other types of solid waste may include workshop scrap, household and other potentially hazardous wastes.

Operation Phase: The most significant waste generating from mining activities will likely occur during the operation phases, which require the movement of small amounts top soil. Other types of solid waste may include workshop scrap, household and non-process related chemicals and other potentially hazardous wastes.
Typical non-hazardous and hazardous wastes that will be generated from operations are as follows:

- Domestic wastes (food waste from temporary camp, some plastics and etc.);
- Regulated waste (batteries, tires and etc.) from workshop;
- General waste (beings wood, un-recyclable plastics, etc.);
- Machinery maintenance materials, such as oily rags, used oil filter and used oil;
- Recyclable scrap metal;
- Fuel and oil handling and storage.

Decommission/Closure Phase: During the demolition phase the dismantling of project temporary camps and related infrastructures will result in large quantities of solid waste. The waste will consists of demolition debris such as wood, glass and etc.

7.5.7.2 Liquid Waste

Preparation Phase: Up to 10 personnel will be present at the camp during the preparation phase. Wastewater generated by the increased number of workers will cause aggravation of the existing water quality, if enough portable toilets are not provided at the preparation site.

Operation Phase: During the operation phase, wastewater from domestic may be sources of pollution of nearby water sources. Wastewater generated by the increased number of workers will cause aggravation of the existing water quality if enough portable toilets are not provided at the project site. In addition, wastewater effluent will be generated from sanitary waste produced by 12 employees.

Decommission/Closure Phase: During the decommissioning phase, the generation of sanitary wastewater discharges may occur in varying quantities, depending on the number of workers involved.

7.5.8 Fire Hazards

Preparation, Operation and Decommissioning/Closure Phase

In the clay soil mining area, significant hazards can be occurred due to oil barrel and diesel will be stored in project compound for generator and clay soil mining operation activities, without the proper storage system, that can cause fire hazards during the operation phase. Other types of fire hazards may include storage of preparation and decommissioning materials, improper handling or maintenance of electrical equipment and other related preparation and decommissioning equipment.

7.5.9 Impacts on Occupational and Community Health and Safety

Preparation, Operation and Decommissioning/Closure Phase

In the preparation and decommissioning/closure phase, significant hazards can be occurred due to the potential fall of material or tools as well as temporary hazards such as physical contact, spills, dust emission and noise pollution. Moreover, accidents and injuries to workers and local communities can be caused by the heavy vehicles movement for the transport of construction materials and equipment.

7.5.10 Socio-economic Resources during All Stages of the Mine Cycle

Clay soil mining activities can suddenly affect quality of life and the physical, mental, and social well-being of local communities. Indirect effects of clay soil mining on public health can include increased incidence of asthma, emphysema, and chronic bronchitis diseases.

The Clay soil mine provides effective poverty relief by providing jobs. Most of the impact on socio-economic environment may be positive associated with some adverse effects. During all phases, clay soil mining operation will require both skilled and unskilled employees; thus will provide temporary employment opportunities. Consequently, socio-

economic standards of near the local people will be increased and eventually it may lead to the economic growth at the local and regional level.

During preparation and operation phase, there will be employment opportunities to the population of the nearby villages directly concerned with the work associated with the clay soil mining operation. But, during the demolition phase, most of the workers at the clay soil mining become jobless and their income will be affected. But, clay soil mining may create jobs, roads, schools, and increase the demands of goods and services in and around the Kaw Pa Naw Village track and Malkaro Village track.

7.6 ENVIRONMENTAL IMPACT AND SIGNIFICANCE

Potential impacts are identified in terms of the each environmental issue, likely impacts during preparation, operation and decommission/closure phases.

Mine preparation also involves the preparation of facilities to process the clay soil, temporary camp and other related activities. The site will extract clay soil at Kaw Pa Naw village tract. So, the site will clear for land preparation of temporary camps, kitchen, water storage tanks, workshop, toilets and etc. So, the landscape will be changed from forest to the mining site resulting displacement of vegetation, change in visual quality and loss of key habitat types for the local flora and fauna.

The impacts are likely to be significant as duration and severity of impact are high with the irreversible nature of the recovery of the existing vegetation in the long term. Electrical power supplies are established from existing power generation facilities, for the preparation of on-site power generation facilities. The preparation phase of the project activities, their impacts and significance, the impact are shown in **Table 7.4**.

Table 7. 4 Analysis Potential Impacts during Preparation Phase

Item	Environmental Impacts	Project Activities	Significance of Potential Environmental Impacts					Impact Significance
			M	D	E	P	SP	
A	**Preparation Phase: This phase that corresponds to some event, process, or activity that occurs during the preparation and renovation phase of the project.**							
1.	Aesthetics	• Complete destruction of the resource through surface disturbance or excavation; • Degradation or destruction due to topography or hydrological pattern change; • Changes of soil movement (removal, erosion, sedimentation and etc.); and • Clearing of vegetation, large excavations with heavy machines and vehicles. • Construction of camp and buildings.	5	2	1	5	40	Moderate
2.	Air Quality	• Operation and maintenance of vehicles; • Any on-site power generation	4	2	1	4	32	Moderate

Item	Environmental Impacts	Project Activities	Significance of Potential Environmental Impacts					Impact Significance
			M	D	E	P	SP	
A	**Preparation Phase: This phase that corresponds to some event, process, or activity that occurs during the preparation and renovation phase of the project.**							
		facilities; • Site preparation and other related preparation activities; • Land clearance and preparation activities; • Topsoil loading, unloading and transportation; • Building, temporary camp and access road construction.						
3.	Odor	• Vehicles, heavy machineries and other related machineries	1	2	1	3	12	Very Low
4.	Noise and Vibration	• Vehicle engines; • Power generation; • Transportation of preparation materials and other preparation machineries and equipment;	3	2	1	3	18	Low
5.	Soil Quality and Terrestrial Ecosystem	• Site cleaning, earth moving and excavation activities; • Removal and compaction of soil, working activities; and • Removal of topsoil layer. • Land conversion due to the excavation works and removal of existing vegetation.	5	2	1	4	32	Moderate
6.	Water Quality and Aquatic Ecosystem	• Removal of trees and other vegetation and leveling the site; • Site preparation activities such as soil excavation and removal works during the rainy season • Fuel spilling due to the fuel transportation, handling and storage and maintenance of vehicle; • Sewage disposal (unsystematically)	3	2	2	3	21	Low
7.	Waste Generation	**Solid Waste** • Movement of small amounts top soil; • Include workshop scrap, household and other potential hazardous waste; and **Liquid Waste** • Wastewater generated by workers • Runoff water from project site **Hazardous Waste** • Storage and handle hazardous materials (diesel oil).	3	2	1	3	18	Low

Item	Environmental Impacts	Project Activities	Significance of Potential Environmental Impacts					Impact Significance
			M	D	E	P	SP	
A	**Preparation Phase: This phase that corresponds to some event, process, or activity that occurs during the preparation and renovation phase of the project.**							
8.	Fire Hazards	• Fuel transportation, handling and storage • Improper handling or maintenance of electrical equipment and other related preparation equipment • Open burning on site or nearby	3	2	2	3	21	Low
9.	Occupational Health and Safety	• Physical contact, spills, dust emission and noise pollution; • Accidents and injuries to workers and local communities; • Respiratory Hazardous • Contagious diseases due to the migrant workers and increased workers.	3	2	1	4	24	Low
10.	Community Health and Safety	• Respiratory hazards due to the dust emission from the excavation and transportation activities. • Nuisance due to noise pollution • Traffic accident • Contagious diseases due to the migrant workers and increased workers. • Fire hazards	3	2	2	3	21	Low
11.	Social and economic standard	• Works opportunities for local people • Create jobs, roads, schools	x	x	x	x	x	Positive Impact

During the operation stage, the topsoil and vegetation will be removed for extraction of clay soil. Moreover, the operation phase of the project includes site clearance, excavation and transportation for clay soil recover and etc. clay soil mining operations have the potential to impact of the quality of the air, noise, soil, surface water and groundwater and etc. on and around site. The operation phase of the project activities, their impacts and significance impact are seen in **Table 7.5**.

Table 7.5 Analysis Potential Impacts during Operation Phase

Item	Environmental Impacts	Project Activities	Significance of Potential Environmental Impacts					Impact Significance
			M	D	E	P	SP	
B	**Operation Phase: This phase that corresponds to any event, process, or activity that occurs during the operation (i.e. fully functioning) phase of the proposed project.**							
1.	Aesthetics	• Complete destruction of the resource through surface disturbance or	5	4	1	5	50	High

Item	Environmental Impacts	Project Activities	Significance of Potential Environmental Impacts					Impact Significance
			M	D	E	P	SP	
B	**Operation Phase: This phase that corresponds to any event, process, or activity that occurs during the operation (i.e. fully functioning) phase of the proposed project.**							
		excavation; • Degradation or destruction, due to topography or hydrological pattern change; • Changes or from soil movement (removal, erosion, sedimentation); and • Visual impacts due to clearing of vegetation, large excavations, heavy metals and vehicles.						
2.	Air Quality	• Using heavy machines and vehicles in excavation, transportation and stockpiling works. • Top soil stripping, transportation and storage; • Land clearing and Road grading; • Fuel burning in heavy equipment and vehicles and generators; • Haul roads and infrastructure;	4	4	1	4	36	Moderate
3.	Odor	• Vehicles, heavy machineries and slurry pump machineries and other related machineries.	2	4	1	3	21	Low
4.	Noise and Vibration	• Using heavy machines and vehicles in excavation, transportation and stockpiling works. • Other internal combustion engine powered equipment; and • Heavy machines and vehicles maintenance	3	4	1	4	32	Moderate
5.	Soil Quality and Terrestrial Ecosystem	• Top soil remove and kept for later re-use; • Spills or leakages from machineries, vehicles and fuel storage area. • Land conversion due to the excavation and stockpiling works and clearance the existing vegetation.	4	4	1	5	45	High
6.	Water Quality and Aquatic Ecosystem	• Clearing land form for operational purpose; • Discharged water from dewatering process.. • Seepage from the storage of sedimentation pond; and • Storage and use of hazardous materials (oil etc.) on site. • Site runoff and storm water during the	4	4	1	4	36	Moderate

Item	Environmental Impacts	Project Activities	Significance of Potential Environmental Impacts					Impact Significance
			M	D	E	P	SP	
B	**Operation Phase: This phase that corresponds to any event, process, or activity that occurs during the operation (i.e. fully functioning) phase of the proposed project.**							
		rainy season.						
7.	Waste Generation	**Solid Waste** • Domestic waste (food waste from temporary camp, some plastics and etc.); • Regulated waste (batteries, tires and etc.) from the workshop; • General waste (beings wood, un-recyclable plastics, etc.); • Recyclable scrap metal; **Liquid Waste** • Site runoff and storm water; • Domestic wastewater generated by the increased number of workers; **Hazardous** • Spilling fuel and oil from fuel handling and storage (diesel, lubricant etc.);	3	4	2	3	27	Low
8.	Fire Hazards	• Storage of diesel and fuel oil with oil barrel • Improper handling or maintenance of electrical equipment and other related preparation equipment • Open burning on site or nearby	3	4	2	3	27	Low
9.	Occupational Health and Safety	• Respiratory diseases, musculoskeletal problems occur in vehicle and equipment, • Physical contact, spills, dust emission and noise pollution; • Accidents and injuries to workers and local communities.	3	4	1	4	32	Moderate
10.	Community Health and Safety	• Respiratory hazards due to the dust emission from the excavation and transportation activities. • Nuisance due to noise pollution • Traffic accident • Contagious diseases due to the migrant workers and increased workers. • Fire hazards	3	4	2	3	27	Low
11.	Social and economic standard	• Works opportunities for local people • Create jobs, roads, schools	x	x	x	x	x	Positive Impact

The decommissioning/ closure phase related activities include operation of earth moving equipment, decommissioning machineries and equipment and other related decommissioning/ closure activities. The decommissioning/ closure phase of the project activities, their impacts and significance impact are seen in **Table 7.6**.

Table 7.6 Analysis Potential Impacts during Decommissioning/Closure Phase

Item	Environmental Impact	Project Activities	Significance of Potential Environmental Impacts					Impact Significance
			M	D	E	P	SP	
C	**Decommissioning/Closure Phase: This phase that corresponds to some event, process, or activity that occurs during the decommissioning phase (e.g. destruction, dismantling) of the project. Where needed, any existing hazardous materials used in decommissioning of these would be properly handled and disposed of in accordance with governing authority requirement.**							
1.	Aesthetics	• Backfilling with topsoil • Dust generation from excavation and backfilling works. • Removal of infrastructure.	4	1	1	4	24	Low
2.	Air Quality	• Operation of heavy machines and vehicles for decommissioning works; • Open burning on site or nearby.	4	1	1	4	24	Low
3.	Odor	• Vehicles and demolishing machineries • Open burning on site or nearby	3	1	1	3	15	Low
4.	Noise	• Using heavy machine, vehicle and demolishing machineries and generators. • Other related demolition activities.	4	1	1	4	24	Low
5.	Soil Quality and Terrestrial Ecosystem	• Backfilling facilities and related other mine facilities; • Re-grading, re-contouring and sedimentation pond cover. • Removal of buildings and foundations.	4	1	1	4	24	Low
6.	Water Quality and Aquatic Ecosystem	• Backfilling facilities and related other mine facilities. • Excavation or demolition during rainy periods; • Leakage of oil and grease from vehicles and demolished machines.	4	1	1	4	24	Low
7.	Waste Generation	**Solid Waste** • Dismantling of project building and related infrastructures; • Demolition debris such as wood, glass and etc. • Domestic waste (food waste from temporary camp, some plastics and etc.); **Liquid Waste** • Sanitary wastewater discharges **Hazardous Waste**	4	1	1	4	24	Low

Item	Environmental Impact	Project Activities	Significance of Potential Environmental Impacts					Impact Significance
			M	D	E	P	SP	
C	**Decommissioning/Closure Phase: This phase that corresponds to some event, process, or activity that occurs during the decommissioning phase (e.g. destruction, dismantling) of the project. Where needed, any existing hazardous materials used in decommissioning of these would be properly handled and disposed of in accordance with governing authority requirement.**							
		• Spilling fuel and oil from fuel handling and storage (diesel, lubricant etc.);						
8.	Fire Hazards	• Storage of decommissioning materials • Improper handling or maintenance of electrical equipment and other related decommissioning equipment • Open burning on site or nearby	3	1	2	3	18	Low
9.	Occupational Health and Safety	• Physical contact, spills, dust emission and noise pollution; • Accidents and injuries to workers and local communities;	3	1	1	4	20	Low
10.	Community Health and Safety	• Respiratory hazards due to the dust emission from the excavation and transportation activities. • Nuisance due to noise pollution • Traffic accident • Contagious diseases due to the migrant workers and increased workers.	3	1	2	3	18	Low
11.	Social & economic standard	• Works opportunities for local people • Create jobs, roads, schools • Permanent workers will be jobless	x	x	x	x	x	Positive Impact

7.7 SUMMARY OF IMPACTS SIGNIFICANCE

Primary and secondary data were used to assess the environmental impacts. The potential environmental impacts were assessed in a comprehensive and scientific manner. The report provides a full picture of all potential environmental impacts associated with the proposed June Group Cement Industry Limited, and provide recommendations for suitable mitigation measures. The results after scoring evaluation of significant environmental impacts can be summarized in the **Figure 7.2**.

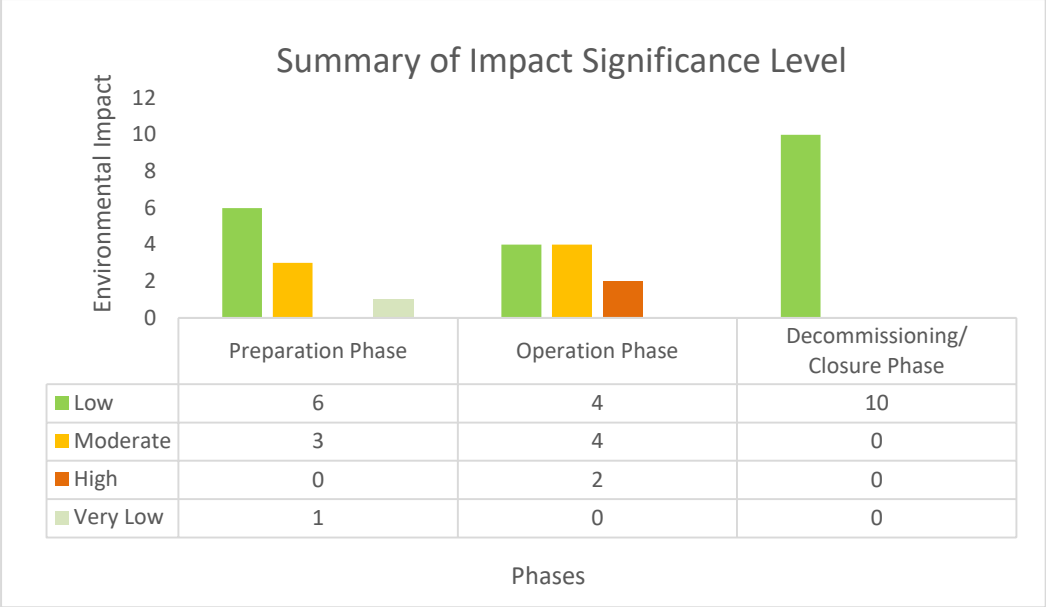


Figure 7.2 Summary of Impact Significance Level due to Project Activities

As per the result of analysis, low significant impact on environmental occurred during all phases such as preparation, operation and decommissioning/closure phases. Moreover, some project activities show moderate significance in the preparation and operation phases. However, some project activities show high significance during the operation phase. Therefore, mitigation measures should be performed especially for activities relating to preparation and operation phase. Some mitigation measures are described in the following and should be performed accordingly.

7.8 MITIGATING ADVERSE IMPACTS OF THE PROPOSED PROJECT

As identified earlier, potential adverse impacts of the proposed project may include air emissions, water, soil, waste disposal and public health and occupational health hazards. Proposed mitigation measures for the above-mentioned adverse impacts are discussed in the following paragraphs.

7.8.1 Mitigation Measures on Aesthetics

Preparation, Operation and Decommissioning/Closure Phase: Mitigation measures that need to be implemented in the mine site to reduce the aesthetics include:

- A rehabilitation plan for the mine site will reconvert to an environment close to its original state by replanting which will one way or other enhance the aesthetic value
- Minimize visual intrusion of clearing of vegetation;
- Do not clear any vegetation for maintenance activities;
- Provide thick green belt along the boundary of the mining area
- Contact Forest Department personnel and planned to do replanting at selected spots; and
- Where possible the design and the site preparation team should seek to retain the trees, reducing the visual impact as possible.

During the operational phase large area of land will be subject to clay soil mining operations that will clear most of the vegetation that will take a long time to rehabilitate and will likely lead to be a landscape scarring as the land will be incompatible with the surrounding landscape. June Cement Industry Ltd. should contact Forest Department, Mawlamyine Region for developing a rehabilitation plan to proceed at the closure phase.

7.8.2 Mitigation Measures of Air Quality

Preparation Phase: The following measures need to be implemented as mitigation measures that need to be implemented to reduce air quality:

- Restrict site preparation activities;
- Provide Personal Protective Equipment (PPE) such as dust masks where dust levels are high; and
- Maintain heavy machineries used for site preparation properly.
- Limit speed of speed vehicle travelling on internal roads
- Provide thick green belt along the boundary of the mining area

Operation Phase: The following measures need to be implemented as mitigation measures that need to be implemented to reduce air quality;

- Ensure control of fossil fuels (diesel, petrol) consumption on a daily basis;
- Control vehicle speed in the premises of the project site;
- Provide Personal Protective Equipment (PPE) such as dust masks where dust levels are high.
- Along the haul road, water spray system should be applied.

Decommissioning/Closure Phase: The following measures need to be implemented as mitigation measures that need to be implemented to reduce air quality:

- Schedule decommission activities;
- Perform regular inspection and maintenance of decommissioning vehicles and equipment; and
- Provide Personal Protective Equipment (PPE) such as dust masks where dust levels are high.

7.8.3 Mitigation Measures of Odor

Preparation, Operation and Decommissioning/Closure Phase: Mitigation measures that need to be implemented in the mine site to reduce the odor include:

- Ensure control of fossil fuels (diesel, petrol) consumption on a daily basis; and
- Provide Personal Protective Equipment (PPE) such as facemasks where odor levels are high.

7.8.4 Mitigation Measures of Noise and Vibration

Preparation, Operation and Decommissioning/ Closure Phase: Mitigation measures that need to be implemented in the mine site to reduce the noise and vibration include:

- Schedule noisy preparation activities;
- Perform regular inspection and maintenance of operation vehicles and equipment;
- Limit speed of vehicles on site;

- Restrict work times, modify equipment and appropriated site works, as part of the planning process for exploration sites to minimize noise disturbance.
- Reduce power operation-use only necessary size and power;
- Plan the noisy decommissioning works during the day;
- Provide thick green belt along the boundary of the mining area;
- Provide enclosures for particularly noisy equipment such as generator; and
- Provide PPE particularly hearing protection devices for those working in noisy areas.

7.8.5 Mitigation Measures of Soil Quality and Terrestrial Ecosystem

Preparation Phase: The following measures need to be implemented as mitigation measures that need to be implemented to reduce soil quality and terrestrial ecosystem:

- Reuse excavated materials for backfilling works;
- Clearly marked soil storage areas and restrict vehicle activity appropriately;
- Limit access by miners to adjacent habitats to reduce potential habitat degradation and interaction with wildlife;
- Minimized the disturbed area so as to keep the landform and topography not much altered; and
- Select appropriate low impact vegetation clearing methods.

Operation Phase: The following measures need to be implemented as mitigation measures that need to be implemented to reduce soil quality and terrestrial ecosystem:

- Do not extend the excavation area in the operation stage larger than that allowed by the MIC;
- Minimize the disturbed area so as to keep the landform and topography not much altered; and
- Select appropriate low impact vegetation clearing methods.

Decommission/Closure Phase: The following measures need to be implemented as mitigation measures that need to be implemented to reduce soil quality and terrestrial ecosystem:

- Rehabilitate progressively of the site where operations allow;
- Conduct rehabilitation work completely;
- Stabilize of mine areas to prevent erosion, loss of seed bank and reduce feral animal infestation (e.g. seeding of soil stockpiles);
- Handle correctly for topsoil once stripped during the operation stage ;
- Restore vegetation (trees) for reuse as habitat in rehabilitating areas; and
- Optimize re-vegetation at decommissioning/closure stage when seasonal conditions are favorable for promoting seed survival.

7.8.6 Mitigation Measures of Water Quality and Aquatic Ecosystem

Preparation Phase: The following measures need to be implemented as mitigation measures that need to be implemented to reduce water quality and aquatic ecosystem:

- Contaminate water shall be reduced by avoiding earthwork in rainy season;
- All site water is either reused on-site or evaporated;
- Salvage topsoil for use in rehabilitation;
- Temporary toilet shall be provided for workers;
- Water quality monitoring shall be carried out regularly; and

- Repairs, maintenance works for motor vehicles shall not be carried out close to the stream.

Operation Phase: The following mitigation measures that need to be implemented to reduce water quality and aquatic ecosystem:

- Surface runoff from mine site must be collected and channeled to sedimentation pond;
- Control surface water run-off so as to direct away from pit walls;
- Dewatering shall control to ensure groundwater levels are maintained and discharged water must be directly channeled into sedimentation pond;
- Temporary toilet shall be provided for workers;

Decommissioning/Closure Phase: The following mitigation measures that need to be implemented to reduce water quality and aquatic ecosystem:

- Leak proof containers shall be used for storage and transportation of oil and grease, and keeping the impervious floors of oil and grease handling areas;
- Temporary toilet shall be provided for workers.

7.8.7 Mitigation Measures of Waste Generation

7.8.7.1 Mitigation Measures of Solid Waste

Preparation Phase: The following measures need to be implemented as mitigation measures that need to be implemented to reduce solid waste generation:

- Separate bins for food waste, metal and other waste to be located throughout the temporary camp and other facilities on site;
- Combustible items shall be burned in the designated area and non-combustible items should be land filled or recyclable and reusable;
- Appropriate signage shall be used to identify potential spill risk and other hazards; and
- Some types of the waste shall be land filled, some be reused and some be recycled.

Operation Phase: The following measures need to be implemented as mitigation measures that need to be implemented to reduce solid waste generation:

- Smoking shall be strictly prohibited from any site where fuel loading operations take place;
- All used petroleum products shall be collected in tank marked “Waste Oil” and disposed of under the direction of the mine coordinator;
- Empty petroleum containers shall be stored on site in a designated area and returned to the supplier on back hauls;
- Reuse waste rock to fill voids both on the surface;
- All hazardous materials (diesel oil) should be stored in a properly self-bunded tank as appropriate for the volume and nature of the materials.

Decommissioning/ Closure Phase: The following measures need to be implemented as mitigation measures that need to be implemented to reduce solid waste generation:

- The effective solid waste management system should be provided;
- Where recycling/reuse is not possible, the material should be taken to the municipal waste disposal site.

7.8.7.2 Liquid Waste

Preparation Phase: Temporary toilets shall be provided during the preparation phase.

Operation Phase: Mine workers will systematically manage for domestic liquid waste in clay soil mine site. The clay soil mining operation shall provide 2 toilet facilities for 12 employees, which are completely adequate in accordance with the basic HSE guidelines (2007) as shown in **Table 7.7**.

Table 7. 7 Toilet Facilities for Workers

Number of workers or residences of each gender	Minimum number of water closet	Minimum number of sinks
1-15	1	1
16-35	2	2
36-55	3	3
56-80	4	4
81-110	5	5
111-150	6	6
>150	**	**

Sources: HSE guidelines, 2007

Decommissioning/ Closure Phase: During the decommissioning phase, to reduce and control of liquid waste disposal, demolition activities shall be performed with the use of appropriate health and safety procedures in accordance with the regulatory requirements.

7.8.8 Mitigation Measures of Fire Hazards

Preparation and Decommissioning/Closure Phases

At the project site, about three extinguishers will be set up inside of the mine area for fire hazards. In case of fire emergency, the water for firefighting system can be obtained easily from one ground water storage tank. In addition, the project proponent has plans to provide training on firefighting for the employees by a professional or otherwise by sending to Fire Force Department for training courses. The proponent shall perform the following measures to prevent the fire hazards in the project site.

- Fire extinguishers and signage will be installed in the clay soil mine site.
- Regular inspection and testing of oil barrel storage area

- Employee instruction in regard to how to follow manufactures' directions and how to properly handle appliances.
- All emergency phone numbers should be identified, listed in the emergency preparedness plan and posted. Each department should display the diagram in a highly visible area.

7.8.9 Mitigation Measures of Occupational Health and Safety

Preparation and Decommissioning/Closure Phases

The representative of project proponent must provide a health and safety management plan for the preparation workers based on the EMP. For the safety of preparation workers, adequate safety measures, including the availability of first-aid facilities shall be implemented on the project site. Several employment opportunities will be created for preparation and demolition workers, though this will be short term. Adherence to the Occupational Health and Safety Rules and Regulations shall be adopted. Personal Protective Equipment (reflective clothing's, dust mask, safety shoes, hard hats, etc.), shall be provided as shown in **Table 7.8**. Site fencing and safety signage should be done in this phase as shown in **Table 7.9**.

Table 7. 8 Personal Protective Equipment (PPE) and Their Functions

Required Personal Protective Equipments	Functions of PPE	Part of the Body to be protected	Features and characteristics of PPE
Operation Phase			
Dust respirator, Safety Glasses, earplugs, gloves, reflective clothing and safety footwear	Protection from fine particles, bright light, nuisance, allergic, visibility of employees, falling objects and etc.	Head, Nose, mouth, Eye, Ear, Hand, Body and Foot	
Dust Goggles	Protection from dust, fine particles, smoke and mercury vapors	Noise and mouth	
Dust Mask			

Table 7. 9 Safety Signage and Their Descriptions during the Operation Phase

Description	Safety Signage
These signs indicate all visitors must report to the site office and obtain permission to proceed on to the site or any work area and safety equipment must be used at all time.	

Description	Safety Signage
These signs should be used to make people aware of nearby dangers such as diesel fuel.	

Operation Phase: Mitigation measures for health and safety impacts on employees of the clay soil mining operation are as follows;

- The representative of project proponent should have a health and safety management plan for the operation workers based on the EMP;
- For the safety of operation workers, adequate safety measures, including the availability of first-aid facilities shall be implemented on the project site.
- Training and licensing, vehicle operators should be provided in the safe operation of specialized vehicles such as backhoe.
- All workers shall be trained in emergency evacuation procedures and performed fire drills regularly.
- When working with mercury always use latex glove, they are cheap and provide good protection.

Personal Protective Equipment (safety glasses, eyewear, dust masks, safety gloves, earmuffs, etc.) and their functions as shown in **Table 7.7** shall be provided and machinery safety measures shall be posted at the mine site. Safety signage and their descriptions as shown in **Table 7.8** are to be provided and required machine cover will be installed as necessary.

7.8.10 Mitigation Measures of Community Health and Safety

Preparation and Decommissioning/Closure Phases

Mitigation measures that need to be implemented to reduce Community health and safety include:

- Controlling the pollutant emissions (Air, Noise and Water) within the NEQEG;
- Safety and Prohibition signs must be used around the project site
- Providing health services and medicines to community clinic.
- Fencing should be surrounded around the project site
- Provide thick green belt along the boundary of the mining area

CHAPTER 8

PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

8.1 MEETING PURPOSE OF THE PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

It is important to disclose the information about the project during the preparation of IEE report and the opinions of all stakeholders should be considered in implementation of the project. Consultation meeting should be held with people potentially to be affected by the project, administrative bodies, community-based organizations non-governmental organizations, and social organizations. Especially results of consultation with project affected people should be considered in evaluation of impacts, design of mitigation measures and monitoring plans. It is also needed to negotiate with related governmental organizations. Meeting Minutes on Public consultation and information disclosure of Initial Environmental Examination (IEE) of Clay soil Mining Operation, June Cement Industry Ltd. Public consultation power point and attended list attached in **Appendix 4 and Appendix 5.**

8.2 METHODOLOGY AND APPROACH

Information disclosure should be done by announcing the public consultation meeting about the proposed project and its potential impacts to the public and social organizations via local and national media, by posting on the website of the project proponent, by setting up signboards at the project area within an adequate time needed to inform the public. All feedbacks from public consultation meetings should be well addressed and considered in the formulation of EMP, environmental monitoring plan and CSR plan. In this case, the proponent has to inform and invite governmental officials and private companies near the project site and local community to attend the public consultation meeting.

Public consultation and information disclosure concerning with the Initial Environmental Examination (IEE) for the Projects proposed by June Cement Industry Limited was held on 15th June 2019 at Malkaro village, Kyaikmaraw Township, Mon State. It is aimed at disclosing the findings of environmental and social studies and the likely impacts upon them as well as mitigation and monitoring schemes to remediate the impacts caused by the project activities. The impacts were studied for all activities to be carried out in three phases: construction phase, operation phase and decommissioning phase. It is also aimed at receiving public recommendations, feedbacks upon the studies.

Table 8. 1 Meeting Records

E Guard Environmental Services Co., Ltd. **Meeting Minutes**	
Subject: Public Consultation of Initial Environmental Examination for related projects in Cement Plant by June Cement Industry Ltd.	**Date:** 15/June/2019
Venue: Malkaro Monastery, Malkaro Village, Kyaikmaraw Township, Mon State.	**Time**: 10:00 AM-12:00 PM
Attendees: **Local People - 106** **Parliament Member - 9** **Government - 22** **Media - 4** **NGO - 2** **Private Company – 9** **Total – 152**	
Prepared by : U Lwin Thu Htun (Project Associate, E Guard Environmental Services) U Zwe Wint Phyoe (Project Assistant, E Guard Environmental Services)	

The Stakeholder meeting was held by the following Agenda:

1. Opening Ceremony
2. Opening speech by U Saw Aung Myint Khine (Minister of Kayin Ethnic Affair, Mon State)
3. Speech by U Khin Zaw Oo (Amyotha Hluttaw Representative, Mon State)
4. Presentation of project descriptions about related projects of June Cement Industry Ltd. by U Tin Oo (Director, June Cement Industry Ltd.)
5. Presentation about the Initial Environmental Examination and Procedure of IEE by U Tin Aung Moe (Director, E Guard Environmental Services)
6. Questions and Suggestions by Attendees
7. Closing Remarks by U Saw Kyaw Win Maung (Pyithu Hluttaw Representative, Mon State)

1. **Opening Ceremony**
2. **Opening Speech by U Saw Aung Myint Khine (Minister of Kayin Ethnic Affair, Mon State)**

Briefly, he said, all of you know that today's ceremony is public consultation for related four projects of cement industry. Public consulation is a must to do and all of you can ask the questions freely which you would like to know without hesitating.

3. **Speech by U Khin Zaw Oo (Amyotha Hluttaw Representative, Mon State)**

Firstly, he said that he didn't know the detail process of project as well as the villagers (local people). So, the villagers should ask the questions so as to know clearly about the project and he also prepared to ask. He hoped that the project client will be explained how they prepared and planned so that the project would not impact the public and environment. Apparently, June Company proposed MIC and bought the farmlands from nearby villages for the project since 2010. June Company will construct the road near the villages in order to ease project transportation. So the transportation becomes better than before and 700 people will be assigned when the June project is operating. Therefore, local people will get the opportunities. On the other hand, June Company is currently supporting and funding the local people from nearby villages (for example, education, healthcare, etc).

4. **Presentation of project descriptions about related projects of June Cement Industry Ltd. by U Tin Oo (Director of June Cement Industry Ltd.)**

Briefly, he presented about the related projects, facts and figures of the projects, existing projects' conditions and corporate social responsibility of June Cement Industry Ltd.

5. **Presentation about the initial environmental examination and procedure of IEE by U Tin Aung Moe (Director of E Guard Environmental Services)**

He firstly explained about the requirements of Initial Environmental Examination of the project which has been prepared in line with the EIA procedure of Environmental Conservation Department of the Ministry of Natural Resources and Environmental Conservation (MONREC), objectives of public consultation, related laws and regulation, background environmental condition of project site. He also presented the anticipated environmental and social impacts, mitigation measures, processes and schedule that will be mentioned and prepared in the IEE Report.

6. **Questions and Suggestions by Attendees**

Questions (1): U Khin Zaw Oo (Amyotha Hluttaw Representative, Mon State)

He said that how do you plan for jetty project especially the condition of fishermen who are working along the Attaran River before and after the project? Besides, how do you pay 2 percent of profit for CSR? Does 2 percent of CSR intend to Kyaikmaraw Township or Mon State?

Answers: U Tin Oo (Director, June Cement Industry Ltd.)

He said that when the jetty project is finished, we will only allow the ship transfer within the tonnage limits. Currently, the main operation relating to the project is sand transportation to the project site via barges that are sometimes cause some disturbances to fishing activities especially hook with fishing net. Therefore, care has to be taken to implement this operation by pointing out with small boat in front of the barges so as to solve this problem. We will also reduce the quantity of shipping time to the lowest during the fishing season. In the case of CSR, CSR should be for Kyaikmaraw Township because our project is located at Kyaikmaraw Township and this township is higher potential to affect by project activities. Thus, we will emphasize the CSR for Kyaikmaraw Township. We will have to plan and fund for CSR or community development. Even though we haven't planned of funded for CSR, we already supported education, healthcare and donated 5 million to Malkaro village and 10 million to Kawt Pa Naw village in the last two years. At present, we are building crematory that is imported from Myawaddy at Malkaro village and the crematory construction will be finished soon.

Questions (2): U Aung Tin Oo (Fishermen Head)

He asked, if fishermen are affected by ship transferring of June Cement Project, who will response that case and who is a respondent person? Nowadays, MCL Company cooperates with the member of fishing team by giving the number of contacted person, ship number. According to the construction of jetty and channel, fishermen who are working there will face the difficulties and lost their opportunities. So, how will you do if fisher men lost their opportunities?

Answers: U Tin Oo (Director, June Cement Industry. Ltd)

Obviously, there may be more or less confrontation between the barges and fisher men due to the project. We will give the contact number of responsible person or set up 24 hour hot line number to inform their grievance or complaint. As well, we will do an engagement with the affected fishermen and we will do best for not losing too much.

Questions (3): U Naing Shwe Win (Villager, Malkaro Village)

He wanted to know, which power plant is going to be used for cement industry? How many MW to be used for that industry? How many tonnages are produced per day? Where is the clay production area? Is it near the village and how far is it? Does it affect or impact to the nearest village? As for him, he isn't going to object or protest the June Company. MCL Company is currently using Attaran River for their ships' transportation. The river is almost damaged by MCL Company. Also, June Company will have to be used Attaran River for their ships' transportation in the future. So, the Attaran River is probably going to be more damaged. So, which company does we complaint about the impacts in the future? Which organization or department has responsibility to act upon the company that damages the environment seriously? Which organization or department monitors whether the project damages the public or not?

Answers: U Tin Oo (Director, June Cement Industry. Ltd)

Recently, we are intending to use coal-fired plant (15 MW of 2 quantities) for power supply. We've proposed coal-fired plant to get permission from the Union of Myanmar. We didn't get permission yet so that we haven't constructed coal-fired plant. We are going to use a very small amount of clay for cement production. Limestone percentage is 80-83%, clay percentage is 12% and clay soil percentage is 8% are needed for cement production. Fortunately, small amount of clay composition is found in limestone production area and we only need around 4% of clay for cement production. Therefore, we will excavate a small amount of clay at clay site. During the production of clay, we will manage carefully not to damage the environment and also the nearby villages. For barges transportation, the public can complaint by informing to the responsible person by calling 24 hours hot line number. For deciding whether the project damages or not, environment conservation department will be monitoring in the future. Nowadays, ECD has many modern instruments for environmental monitoring and the public can see the monitoring results on the website.

Questions (4): Daw Pa Pa (Local People, Malkaro Village)

She said that, we have lost our farmlands without getting any compensation. Therefore, we would like to get the compensation not only by giving cash but also providing an alternative land. So, do we lose ours without getting any compensation like that? Which opportunities can we get?

Answers: U Tin Oo (Director, June Cement Industry. Ltd)

He said that the purpose of today's ceremony is only noticing and requesting opinions from the local people for the related projects of June Cement Industry. Therefore, Land acquisition case is probably concerned with the land acquisition department so we can't decide it right now.

Questions (5): U Naing Htun Kyi (Villager, Malkaro Village)

He said that the main constituent of cement production is limestone. There is a historical cave near the production area of limestone. He only concern about this cave not to damage. How do you manage not to damage the cave during the limestone production period?

Answers: U Tin Oo (Director, June Cement Industry. Ltd)

He said that we are also Buddhism and we will focus on not to be damaged during the operation period. Foremost, we will operate the limestone production from the boundary of MCL Company that is far away from the historical cave. When we blast the limestone, we will use delay detonator which vibrates lesser than the others. Besides, we will do operation charily till the end.

Questions (6): U Khin Zaw Oo (Philanthropic Officer, Malkaro Village)

He said, it is sure that stones will be reached and affect the nearest farms that are not bought or owned by the June Company because of the blasting of limestone. What would you do if it

happened? And the public should know the detail of the projects and June Company should disclose its projects clearly.

Answers: U Tin Oo (Director, June Cement Industry Ltd.)

He said that the farms near the limestone site will not be damaged by the project because we will be using one type of mining method that starts to extract the inner portion of mineral, we would not blast or explode the outer portion. Even if there is damage to the farms, we would buy the farms with reasonable price or give compensation. And if you want to know the details of project, you can list the facts what you want to know and you can ask directly the company office.

Questions (7): U Htain Win (Villager, Mei Ka Yo Village)

He asked about the location of clay production. The villagers are now facing difficulties about transportation due to the construction of factory. The result of air and water monitoring results need to display as Myanmar language so as to read easily by local people. He desired that local people from nearby villages should include in the Grievance Mechanism. And what kind of coal will be used for clean-coal system?

Answers: U Tin Oo (Director, June Cement Industry. Ltd)

We will start using clay from the plot No. 406 and we will manage not to impact the others as much as we can. For announcing the results of air and water monitoring results, we will display it with Myanmar Language by using LED board. Subsequently, we will organize the Grievance Mechanism with public, stakeholders, responsible person, mayors and philanthropic people. In the case of coal, there are four grades of coal and we will be using third-grade coal that is imported from Australian and Indonesia.








Figure 8. 1 Public Consultation of Initial Environmental Examination for related projects in Cement Plant by June Cement Industry Ltd.

CHAPTER 9

INSTITUTIONAL REQUIREMENT AND ENVIRONMENTAL MANAGEMENT PLAN

This Environmental Management Plan (EMP) is an action plan that addresses the potential impacts and risks identified by the environmental impact assessment. Environmental Management Plan (EMP) prepared as an environmental management framework for clay soil mining operation project. The environmental management practices, procedures and responsibilities are defined here into getting full compliance with the existing environmental policy, laws, rules and regulations of the Republic of the Union of Myanmar. This objective is to be achieved through preparation of an Environmental Management Plan (EMP) that addresses the potential impacts and risks identified by the environmental assessment. Environmental Management plan (EMP) in the project cycle must performed six main stages such as project concept, pre-feasibility, feasibility, design and engineering, implementation and monitoring and evaluation and it has a role to play throughout each phase (see **Figure 9.1**).

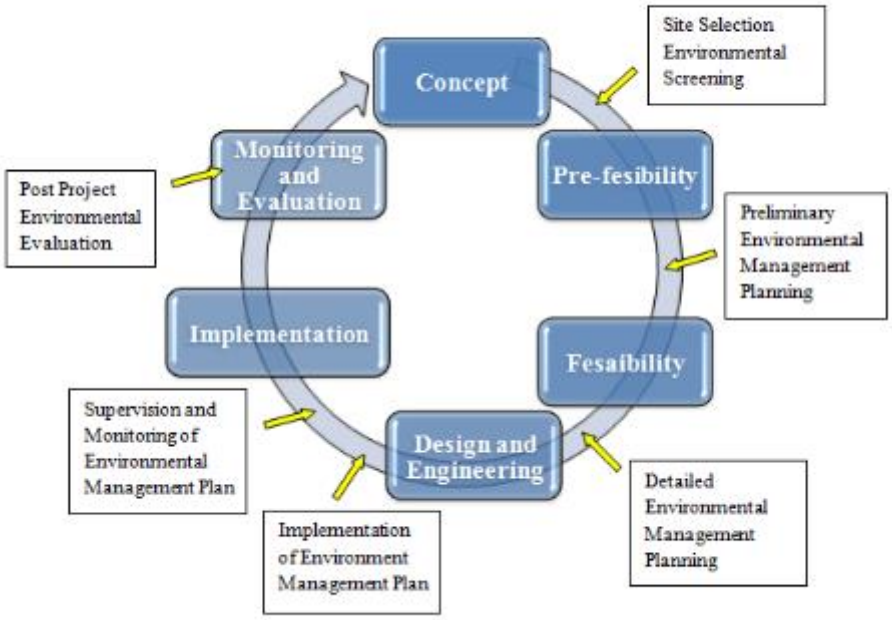


Figure 9. 1 Environmental Management in Project Cycle

Source: Adapted from Asian Development Bank, 1993

Objectives

The objectives of EMP are as follows;

- Identify the possible environmental impacts of the proposed activities;
- Develop measures to minimize, mitigate and manage these impacts and
- Estimate the budget of EMP for each phase

9.1 RESPONSIBLE PERSON FOR EMP

Implementation of the EMP management practices and procedures is the responsibility of all site personnel: however, key personnel (Site Manager, HSE Coordinator, Ministry of Natural Resources and Environmental Conservation (MONREC), Site Leadership Team, Workers and the site Environmental team members) are responsible for communicating environmental matters and ensuring management practices and procedures are being implemented are as follow:

Table 9. 1 Responsible Person for EMP

No.	Position	Department	Responsibilities
1.	Managing Director	June Cement Industry Ltd.	➢ Implementation of the EMP ➢ Supervision and monitoring of the implementation of EMP
2.	HSE Coordinator		➢ Oversight of overall implementation of the project environmental activities ➢ Supervision, monitoring and performing of Health and safety for workers and local people
3.	Site Manager		➢ Implementation of the EMP ➢ Supervision, monitoring and reporting of EMP implementation
4.	Members of MONREC	MONREC	➢ Monitoring and inspection of projects to determine compliance with all environmental and social requirements ➢ The Ministry may impose penalties and/ or require the project proponent to undertake corrective action ➢ Where, the Ministry views that the project is not in compliance, it shall - Promptly inform the project proponent - Indicate specific non-compliances of the project environmental and social requirements; and - Specify a time period for the project proponent to bring the project into compliance ➢ In the event of noncompliance - Inform the project proponent indicating the specific non-compliances with environmental and social requirements; ➢ Where a project is not in compliance or not likely to comply with its environmental and social requirements, take enforcement action including: - Suspension of project operation; and - Employing third parties to correct non-compliance **Source: Environmental Impact Assessment Procedure (2015).**

June Cement Industry Ltd. must manage the development of the proposed project by implementing the EMP which is composed of eight parts as follows;

i) Environmental Management Plan
ii) Environmental Monitoring Plan
iii) Occupational Health and Safety Plan
iv) Community Health and Safety Plan
v) Emergency Preparedness and Response Plan
vi) Topsoil Management Plan
vii) Mine Closure Plan and
viii) Corporate Social Responsible Plan

June Cement Industry Limited is a responsible party to this Environmental Management plan of the clay soil mining operation. The June Cement Industry Limited will review and update this plan at least once annually. Revisions will be made as needed throughout the year. Any suggestions, comments and questions should be directed to June Cement Industry Limited.

9.2 ENVIRONMENTAL MANAGEMENT PLAN

The Environmental Management Plan (EMP) prepared for the proposed project covers the anticipated impacts of the said project, mitigation measures, management and monitoring plans during each of the phases:

- Preparation Phase
- Operation Phase and
- Decommissioning/Closure Phase

The detailed EMP based on the project activities is described in **Table 9.2**.

Preparation Phase: These phases will include site preparation, construction of temporary camps, workshop, water storage tank, toilets and other related activities.

Table 9.2 Environmental Management Plan for Preparation Phase

Item	Potential Environmental Impact	Location	Proposed Mitigation Measures	Mitigation Cost (MMK)	Residual Impact	Responsible Party
A.	**Preparation Phase: This phase that corresponds to some event, process, or activity that occurs during the preparation phase of the project.**					
1.	Aesthetics	All Preparation Site	○ A rehabilitation plan for the mine site will be ploughed back to an environment that will enhance the aesthetic value; ○ Minimize visual intrusion due to clearing of vegetation; ○ Provide thick green belt around the boundary of project site; ○ Do not clear any vegetation for maintenance activities; and ○ Contact Forest Department personnel and plan to do replanting at selected spots.	Already included in cost estimation for EMP	Low	June Cement Industry Limited
2.	Air Pollution	All preparation Site	○ Minimize land disturbance; ○ Limit speed of vehicles travelling on internal roads; ○ Restrict site preparation activities; ○ Provide Personal Protective Equipment (PPE) such as masks where dust levels are high; ○ Provide thick green belt around the boundary of project site; ○ Maintain heavy machineries used for site preparation properly; and ○ Along the haul road, water spray system should be applied.	Already included in cost estimation for EMP	Low	June Cement Industry Limited
3.	Noise and Vibration	All Preparation Site	○ Schedule noisy preparation activities; ○ Perform regular inspection and maintenance of operation vehicles and equipment; ○ Reduce power operation-use only necessary size and power; ○ Provide thick green belt around the boundary of project site; ○ Provide enclosures for particularly noisy equipment such as generator; and	Already included in cost estimation for EMP	Low	June Cement Industry Limited

Item	Potential Environmental Impact	Location	Proposed Mitigation Measures	Mitigation Cost (MMK)	Residual Impact	Responsible Party
A.	**Preparation Phase: This phase that corresponds to some event, process, or activity that occurs during the preparation phase of the project.**					
			○ Provide PPE particularly hearing protection devices for those working in noisy areas.			
4.	Odor	In Mine Site	○ Ensure control of fossil fuels (diesel) consumption on a daily basis; and ○ Provide Personal Protective Equipment (PPE) such as face masks where odor levels are high.	Already included in cost estimation for EMP	Very Low	June Cement Industry Limited
5.	Soil Quality and Terrestrial Ecosystem	All Preparation Site	○ Reuse excavated materials for backfilling works; ○ Clearly marked soil storage areas and restrict vehicle activity appropriately; ○ Limit access by miners to adjacent habitats to reduce potential habitat degradation and interaction with wildlife ○ Minimized the disturbed area so as to keep the landform and topography not much altered; and ○ Select appropriate low impact vegetation clearing methods.	Already included in cost estimation for EMP	Low	June Cement Industry Limited
6.	Water Quality and Aquatic Ecosystem	All Preparation Site	○ Reduce contaminate water by avoiding earthwork in rainy season; ○ Salvage topsoil for use in rehabilitation; ○ Provide temporary toilets for workers; ○ Monitor water quality monitoring regularly; and ○ Conduct repairs and maintenance works for motor vehicles not close to the streams. ○ Discharged water from dewatering process must be directly channeled into sedimentation pond. ○ Surface runoff from mine site must be collected and channeled to sedimentation pond.	Already included in cost estimation for EMP	Low	June Cement Industry Limited
7.	Waste Disposal	All Preparation	**Solid Waste** ○ Locate separate bins for food waste, metal and other waste	Already included in cost estimation for	Low	June Cement Industry

Item	Potential Environmental Impact	Location	Proposed Mitigation Measures	Mitigation Cost (MMK)	Residual Impact	Responsible Party
A.	**Preparation Phase: This phase that corresponds to some event, process, or activity that occurs during the preparation phase of the project.**					
		Site	throughout the temporary camp and other facilities on site; ○ Burn combustible materials in the designated areas and land fill or recycle or reuse for non-combustible items; and ○ Some types of waste should be reused and recycled. **Liquid Waste** ○ Provide temporary toilets during the preparation phase. **Hazardous Waste** ○ Use appropriate signage to identify potential spill risk and other hazards.	EMP		Limited
8.	Fire Hazards	All Preparation Site	○ Provide firefighting training and regular fire drills for all workers; and ○ Provide sufficient fire extinguishing devices.	Already included in cost estimation for EMP	Low	OHSE Officer &June Cement Industry Limited
9.	Occupational Health & Safety	All Preparation Site	○ Develop health and safety management plan during the preparation phase by the representative of the project. Proponent based on EMP; ○ Provide Personal Protective Equipment such as safety gloves, helmets, goggles, earmuffs and etc. during preparation phase; and ○ Provide first-aid facilities and adequate safety measures, for the safety of staff, on the project site. ○ Provide precaution signs around the project site	Already included in cost estimation for EMP	Low	OHSE Officer &June Cement Industry Limited
10.	Community Health & Safety	All Preparation Site	○ Controlling the pollutant emissions within the NEQEG. ○ Providing health services and medicines to community clinic ○ Implementing good public relations among project proponent	Already included in cost estimation for	Low	OHSE Officer &June

Item	Potential Environmental Impact	Location	Proposed Mitigation Measures	Mitigation Cost (MMK)	Residual Impact	Responsible Party
A.	**Preparation Phase: This phase that corresponds to some event, process, or activity that occurs during the preparation phase of the project.**					
			and local people ○ Precaution signs must be located around the project site ○ Fencing should be surrounded around the project site	EMP		Cement Industry Limited
11.	Social & economic standards	All Preparation Site	○ Create job opportunities for temporary employments.	-	Positive impact	June Cement Industry Limited

Operation Phase: During the operation phase the following will be conducted:

- Operation and maintenance of vehicles, heavy equipment and generators;
- Extraction, Excavations, transportation of materials; and
- Stockpile, etc.

Table 9. 3 Environmental Management Plan for Operation Phase

Item	Potential Environmental Impact	Location	Mitigation Measures	Estimated of Cost of Proposed Measures (USD)	Residual Impact	Responsible Party
B.	**Operation Phase: This phase that corresponds to any event, process, or activity that occurs during the operation phase (i.e. Fully functioning) of the proposed project.**					
1.	Aesthetics	In Mine Site	○ Do not clear any vegetation for maintenance activities; ○ Minimize visual intrusion of clearing of vegetation;	Already included in cost estimation for EMP		June Cement Industry Limited

Item	Potential Environmental Impact	Location	Mitigation Measures	Estimated of Cost of Proposed Measures (USD)	Residual Impact	Responsible Party
B.	**Operation Phase: This phase that corresponds to any event, process, or activity that occurs during the operation phase (i.e. Fully functioning) of the proposed project.**					
2.	Air Pollution	In Mine Site	○ Minimize land disturbance; ○ Prohibit uncontrolled burning of domestic waste on site; ○ Follow specific access routes and use designated turning areas by vehicles; ○ Restrict land disturbance to that necessary of current operations; ○ Maintain mining equipment to maximize equipment, fuel efficiency; ○ Ensure control of fossil fuels (diesel, petrol) consumption on a daily basis; ○ Control vehicle speed in the premises of the project site; ○ Provide Personal Protective Equipment (PPE) such as dust masks where dust levels are high. ○ Around the stockpile and along the haul road, water spray system should be applied.	Already included in cost estimation for EMP	Low	HSE Coordinator and June Cement Industry Limited
3.	Noise and Vibration	In Mine Site	○ Perform regular inspection and maintenance of operation vehicles and equipment; ○ Limit speed of vehicles on site; ○ Reduce power operation-use only necessary size and power; ○ Provide enclosures for particularly noisy equipment such as generator; ○ Provide PPE particularly hearing protection devices for those working in noisy areas; and ○ Restrict work times, modify equipment and appropriated site works, as part of the planning process for exploration sites to minimize noise disturbance.	Already included in cost estimation for EMP	Low	HSE Coordinator and June Cement Industry Limited
4.	Odor	In Mine Site	○ Ensure control of fossil fuels (diesel, petrol) consumption on a daily basis; ○ Provide Personal Protective Equipment (PPE) such as face masks where odor levels are high.	Already included in cost estimation for EMP	Low	HSE Coordinator and June Cement Industry Limited

Item	Potential Environmental Impact	Location	Mitigation Measures	Estimated of Cost of Proposed Measures (USD)	Residual Impact	Responsible Party
B.	**Operation Phase: This phase that corresponds to any event, process, or activity that occurs during the operation phase (i.e. Fully functioning) of the proposed project.**					
5.	Soil Quality and Terrestrial Ecosystem	In Mine Site	○ Do not extend the excavation area in the operation stage larger than permitted area. ○ Minimize the disturbed area so as to keep the landform and topography not much altered; and ○ Select appropriate low impact vegetation clearing methods	Already included in cost estimation for EMP	Low	HSE Coordinator and June Cement Industry Limited
6.	Water Quality and Aquatic Ecosystem	In Mine Site	○ Control surface water run-off such that it is directed away from pit walls; ○ Store storm water in appropriate facilities; ○ Control dewatering to ensure groundwater levels are maintained; ○ Provide temporary toilets for workers.	Already included in cost estimation for EMP	Low	HSE Coordinator and June Cement Industry Limited.
7.	Waste Disposal	In Mine Site	**Solid Waste** ○ Locate separate bins for food waste, metal and other waste throughout the temporary camp and other facilities on site; ○ Burn combustible materials in the designated areas and land fill or recycle or reuse for non-combustible items; ○ Use appropriate signage to identify potential spill risk and other hazards; and ○ Landfill some types of waste, some reused and some recycled. **Liquid Waste** ○ Provide sufficient toilets during the operation phase; ○ Dewatering will collect to sedimentation pond and then will be used for plantation and dust suppression. **Hazardous Waste** ○ Collect all used petroleum products in tanks marked "Waste Oil" and disposed of under the direction of the mine coordinator; ○ Empty petroleum containers will be stored on site in a designated area and returned to the supplier on back hauls;	Already included in cost estimation for EMP	Low	HSE Coordinator and June Cement Industry Limited

Item	Potential Environmental Impact	Location	Mitigation Measures	Estimated of Cost of Proposed Measures (USD)	Residual Impact	Responsible Party
B.	**Operation Phase: This phase that corresponds to any event, process, or activity that occurs during the operation phase (i.e. Fully functioning) of the proposed project.**					
			○ Store all hazardous materials (diesel oil) in a properly self-bunded tank as appropriate for the volume and nature of the materials.			
8.	Fire Hazards	In Mine Site	○ Prohibit smoking at any site where fuel loading operations take place; ○ Provide firefighting training and regular fire drills for all workers ○ Provide sufficient fire extinguishers	Already included in cost estimation for EMP	Low	HSE Coordinator and June Cement Industry Limited
9.	Occupational Health &Safety problems	In Mine Site	○ Implement health and safety management plan by the representative of the project proponent for the operation workers based on the EMP; ○ Implement adequate safety measures, including the availability of first-aid facilities on the project site for the operation workers. ○ Conduct training and licensing for vehicle operators of specialized vehicles such as backhoe, aiming at safe operation on site. ○ Train all workers for emergency evacuation procedures and perform fire drills regularly. ○ Provide Personal Protective Equipment (reflective clothing's, dust mask, safety shoes, hard hats, etc.), ○ Provide precaution signs around the project site.	Already included in cost estimation for EMP	Low	HSE Coordinator and June Cement Industry Limited
10.	Community Health & Safety	In Mine Site	○ Controlling the pollutant emissions within the NEQEG ○ Providing health services and medicines to community clinic ○ Implementing good public relations among project proponent and local people ○ Fencing should be surrounded around the project site	Already included in cost estimation for EMP	Low	OHSE Officer &June Cement Industry Limited
11.	Social &	In the Local	○ Work opportunities for employment.	-	Positive	June Cement

Item	Potential Environmental Impact	Location	Mitigation Measures	Estimated of Cost of Proposed Measures (USD)	Residual Impact	Responsible Party
B.	**Operation Phase: This phase that corresponds to any event, process, or activity that occurs during the operation phase (i.e. Fully functioning) of the proposed project.**					
	economic standards	area			impact	Industry Limited

Decommissioning Phase: This phase related activities would require the use of the demolishing equipment. Where needed, any existing hazardous materials used in decommissioning of these would be properly handled and disposed of in accordance with governing authority requirements.

Table 9.4 Environmental Management Plan for Decommission Phase

Item	Potential Environmental Impact	Location	Mitigation Measures	Estimated of Cost of Proposed Measures (USD)	Residual Impact	Responsible Party
C	**Decommission Phase: This phase that corresponds to any event, process, or activity that occurs during the decommissioning (e.g. destruction, dismantling) of the project. Where needed, any existing hazardous materials used in decommissioning of these would be properly handled and disposed of in accordance with local governing authority requirements.**					
1.	Aesthetics	In Mine Site	○ A rehabilitation plan for the mine site will brought back to its initial state by planting trees to enhance aesthetic value.; ○ Contact Forest Department personnel and will plan to do replanting at selected spots	Already included in cost estimation for EMP	Low	June Cement Industry Limited
2.	Air Quality	All decommissioning areas	○ Schedule decommission activities; ○ Perform regular inspection and maintenance of decommissioning vehicles and equipment; and ○ Provide Personal Protective Equipment (PPE) such as dust masks where dust levels are high.	Already included in cost estimation for EMP	Low	June Cement Industry Limited
3.	Noise and Vibration	All decommissioning areas	○ Plan the noisy decommissioning works during the day. ○ Use the demolition machineries, generators and other equipment in good condition and insulated; and ○ Provide PPE particularly hearing protection devices for those working in noisy areas.	Already included in cost estimation for EMP	Low	June Cement Industry Limited
4.	Odor	All Demolishing	○ Ensure control of fossil fuels (diesel, petrol) consumption	Already included in	Low	June Cement

Item	Potential Environmental Impact	Location	Mitigation Measures	Estimated of Cost of Proposed Measures (USD)	Residual Impact	Responsible Party
C	**Decommission Phase: This phase that corresponds to any event, process, or activity that occurs during the decommissioning (e.g. destruction, dismantling) of the project. Where needed, any existing hazardous materials used in decommissioning of these would be properly handled and disposed of in accordance with local governing authority requirements.**					
		Site	on a daily basis; o Provide Personal Protective Equipment (PPE) such as face masks.	cost estimation for EMP		Industry Limited
5.	Soil Quality and Terrestrial Ecosystem	All decommissioning areas	o Rehabilitate progressively of the site where operations allow; o Conduct rehabilitation work completely; o Stabilize of mine areas to prevent erosion, loss of seed bank and reduce feral animal infestation (e.g. seeding of soil stockpiles); o Handle correctly for topsoil once stripped during the operation stage ; o Restore vegetation (trees) for reuse as habitat in rehabilitating areas; and o Optimize re-vegetation at decommissioning/closure stage when seasonal conditions are favorable for promoting seed survival	Already included in cost estimation for EMP	Low	June Cement Industry Limited
6.	Water Quality and Aquatic Ecosystem	All decommissioning areas	o Reduce the excavation and backfilling works during the rainy season. o Use leak proof containers for storage and transportation of oil and grease, and keeping the impervious floors of oil and grease handling areas.	Already included in cost estimation for EMP	Low	June Cement Industry Limited
7.	Waste Disposal	All decommissioning areas	**Solid Waste** o Provide effective solid waste management system; o Take waste to a waste disposal site, where recycling/reuse is not possible. **Liquid Waste** o Provide temporary toilets for workers	Already included in cost estimation for EMP	Low	June Cement Industry Limited

Item	Potential Environmental Impact	Location	Mitigation Measures	Estimated of Cost of Proposed Measures (USD)	Residual Impact	Responsible Party
C	**Decommission Phase: This phase that corresponds to any event, process, or activity that occurs during the decommissioning (e.g. destruction, dismantling) of the project. Where needed, any existing hazardous materials used in decommissioning of these would be properly handled and disposed of in accordance with local governing authority requirements.**					
			○ Use appropriate health and safety procedures **Hazardous Waste** ○ Empty petroleum containers will returned to the supplier on back hauls.			
8.	Fire Hazards	All decommissioning areas	○ Provide appropriate fire extinguishers.	Already included in cost estimation for EMP	Low	June Cement Industry Limited
9.	Occupational Health & Safety problem	All decommissioning areas	○ Use Personal Protective Equipment such as dust masks safety shoes, helmets, etc. ○ Place site fencing and safety signboards. ○ Provide adequate toilet facilities.	Already included in cost estimation for EMP	Low	HSE Officer and June Cement Industry Limited
10.	Community Health & Safety		○ Controlling the pollutant emissions within the NEQEG. ○ Providing health services and medicines to community clinic ○ Fencing should be surrounded around the project site	Already included in cost estimation for EMP	Low	OHSE Officer &June Cement Industry Limited
11.	Rehabilitation	All Mine Site	○ Contact Forest Department personnel and plan for replanting the mine site. ○ Collection of indigenous tree seeds ○ Establish a tree nursery ○ Raise tree seedlings with indigenous species ○ Plan for replanting the mine site. ○ Organize labor force ○ Site Preparation ○ Planting out	Already included in cost estimation for EMP	Positive Impact	HSE Officer and June Cement Industry Limited

Item	Potential Environmental Impact	Location	Mitigation Measures	Estimated of Cost of Proposed Measures (USD)	Residual Impact	Responsible Party
C	**Decommission Phase: This phase that corresponds to any event, process, or activity that occurs during the decommissioning (e.g. destruction, dismantling) of the project. Where needed, any existing hazardous materials used in decommissioning of these would be properly handled and disposed of in accordance with local governing authority requirements.**					
12.	Social & economic standards	All decommissioning areas	○ Work opportunities for temporary employment.	-	Positive Impact	June Cement Industry Limited

9.3 ENVIRONMENTAL MONITORING PLAN

Environmental Monitoring Plan based on the environmental concern is mentioned in **Table 9.5.**

Table 9.5 Environmental Monitoring Plan

Item	Environmental Components	Monitoring Parameters	Monitoring Guidelines and Standards	Monitoring Frequency	Monitoring Points	Estimated Monitoring Cost (MMK)	Monitoring responsibility
A	**Preparation Phase**						
1.	Air Quality	Monitoring of the basic parameters: Temperature, Relative Humidity, Wind speed and direction, O_3, NO_2 , SO_2, PM_{10} and $PM_{2.5}$	NEQ Guideline	Once a year	In Mine Site	Already included in cost estimation for EMP	June Cement Industry Limited
2.	Noise Level	Equivalent noise level dB(A)	NEQ Guideline	Once a year	In Mine Site	Already included in cost estimation for EMP	June Cement Industry Limited
3.	Water Quality	Monitoring of the basic parameters: pH, Total Suspended Solids, Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Oil and Grease, Total Coliform Bacteria, Total Nitrogen and Total Phosphorus	NEQ Guideline	Once a year	Surface Water	Already included in cost estimation for EMP	June Cement Industry Limited
4.	Soil Quality	Monitoring of the basic parameters: Chromium, Cadmium (Cd), Lead (Pb), Arsenic (As), Iron (Fe), Zinc (Zn), Copper (Cu) and Mercury (Hg)	FAO Standards	Once a year	In Mine Site	Already included in cost estimation for EMP	June Cement Industry Limited
5.	Solid and Liquid Waste Management	Visual inspection of sites	-	Monthly	In Mine Site	Already included in cost estimation for EMP	HSE Officer, June Cement Industry Limited
B	**Operation Phase**						
1.	Health and Safety	Appointment of Health, Safety and Environment (HSE) coordinator	OHSE	Once a year	In Mine Site	Already included in cost estimation for EMP	June Cement Industry Limited

Item	Environmental Components	Monitoring Parameters	Monitoring Guidelines and Standards	Monitoring Frequency	Monitoring Points	Estimated Monitoring Cost (MMK)	Monitoring responsibility
2.	Air Quality	Monitoring of the basic parameters: Temperature, Relative Humidity, CO_2, NO_2 , SO_2, PM_{10} and $PM_{2.5}$	NEQ Guideline	Once a year	In Mine Site	Already included in cost estimation for EMP	HSE Coordinator, Third-Party.
3.	Noise Level	Equivalent noise level dB(A)	NEQ Guideline	Once a year	In Mine Site	Already included in cost estimation for EMP	HSE Coordinator, June Cement Industry Limited
4.	Water Quality	Monitoring of the basic parameters: pH, Total Suspended Solids, Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Oil and Grease, Total Coliform Bacteria, Total Nitrogen and Total Phosphorus	NEQ Guideline	Once a year	Surface Water	Already included in cost estimation for EMP	HSE Coordinator, June Cement Industry Limited HSE Coordinator, June Cement Industry Limited
5.	Soil Quality	Monitoring of the basic parameters: Chromium, Cadmium (Cd), Lead (Pb), Arsenic (As), Iron (Fe), Zinc (Zn), Copper (Cu) and Mercury (Hg)	FAO Standards	Once a year	In Mine Site	Already included in cost estimation for EMP	HSE Coordinator, June Cement Industry Limited
6.	Solid and Liquid Waste Management	Visual inspection	-	Monthly	Temporary camp and kitchen	Already included in cost estimation for EMP	HSE Coordinator, June Cement Industry Limited
7.	Fire Hazard	Visual inspection and regular check	-	Monthly	Diesel storage area	Already included in cost estimation for EMP	HSE Officer, June Cement Industry Limited
8.	Environmental Auditing	Location: At Mine Area and Residential Areas (Assess the compliance with this EMP, other existing environmental policy, law, rules and instructions)	EIA procedures (2015) and relevant procedures	Yearly	In Mine Site	Already included in cost estimation for EMP	HSE Coordinator, June Cement Industry Limited

Item	Environmental Components	Monitoring Parameters	Monitoring Guidelines and Standards	Monitoring Frequency	Monitoring Points	Estimated Monitoring Cost (MMK)	Monitoring responsibility
C	**Decommissioning Phase**						
1.	Air Quality	Monitoring of the basic parameters: Temperature, Relative Humidity, Wind speed and direction, O_3, NO_2 , SO_2, PM_{10} and $PM_{2.5}$	NEQ Guideline	Once a year	In Mine Site	Already included in cost estimation for EMP	June Cement Industry Limited
2.	Noise Level	Equivalent noise level dB (A)	NEQ Guideline	Once a year	In Mine Site	Already included in cost estimation for EMP	June Cement Industry Limited
3.	Water Quality	Monitoring of the basic parameters: pH, Total Suspended Solids, Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Oil and Grease, Total Coliform Bacteria, Total Nitrogen and Total Phosphorus	NEQ Guideline	Once a year	Surface water	Already included in cost estimation for EMP	June Cement Industry Limited
4.	Soil Quality	Monitoring of the basic parameters: Chromium, Cadmium (Cd), Lead (Pb), Arsenic (As), Iron (Fe), Zinc (Zn), Copper (Cu) and Mercury (Hg)	FAO Standards	Once a year	In Mine Site	Already included in cost estimation for EMP	June Cement Industry Limited
5.	Solid and Liquid Waste Management	Visual inspection	-	Monthly	In Mine Site	Already included in cost estimation for EMP	June Cement Industry Limited

In order to assess the effectiveness of EMP supervision and monitoring need to be undertaken. Monitoring results, including the development and implementation of corrective action should be documented.

9.4 COST ESTIMATION FOR EMP

The following **Table 9.6** shows the expenditures for the implementation of Environmental Management Plan and it can change according to the situation. We, June Cement Industry Limited also commit that we will add required funds for the implementation of Environmental Management Plan including monitoring plan if this following cost estimation is not enough at the time of real practices through the project lifespan.

Table 9.6 Cost Estimation for EMP Implementation

No.	Item	Unit	Quantity	Unit Cost (USD)	Cost (USD)
(A) Mitigation Measures					
1.	Dust Control (water spraying)	Day	120	80	9,600
2.	Dust, Noise and Aesthetics control (provide thick green belt zone and replanting)	Year		Lump sum	3,000
3.	Noise control measure	Year	1	3,000	3,000
4.	Mine Rehabilitation and reclamation	Year	1		5,000
5.	Fire Extinguishers	Nos.			300
6.	PPE and First Aid Kits			Lump sum	1,000
7.	Medical Check-up and health care facilities	Year		1	3,000
8.	Solid and Liquid waste disposal	Month	12	20	2,400
9.	Dewatering control (sedimentation pond)			Lump sum	3,000
	Subtotal				**414,700**
(B) Monitoring					
1.	Air Quality	Year	1	600	600
2.	Noise Quality	Year	1	100	100
3.	Water Quality	Year	2	400	800
4.	Socio-economic Condition	Year	1	250	250
	Subtotal				**1,750**
(C) Environmental Management and Capacity Building					
1.	HSE Coordinator	Month	6	200	9,600
2.	HSE Assistant	Month	6	150	4,800
3.	Training	1*Year	1	800	800
	Subtotal				**14,400**
	Contingency				**3,000**
Total					**433,850**

9.5 OCCUPATIONAL HEALTH AND SAFETY PLAN

The project proponent should appoint one Health, Safety and Environment (HSE) Coordinator for Health, Safety and Environment (HSE) issues throughout the lifespan of the clay soil production project. HSE Coordinator is responsible for implementation and monitoring of Environmental Management Plan (EMP) and Monitoring Plan as well as coordination with Proponent, local authorities and the nearby communities. HSE coordinator also makes regular review of EMP to cover all potential impacts, amendments and modifications.The tentative schedule for OHSE plan is shown in **Table 9.7**.

The responsibilities of HSE Coordinator are as follows:

- Regular site visits and reporting during preparation, operation and decommissioning/ closure work to check whether the objectives of EMP are being followed.
- The HSE coordinator must keep full records of environmental management activities and present to annual independent third-party environment audit.
- Assess the risk in performing various steps of all production processes such as extraction, transportation and stockpiling through operation, and appropriate safety measures.
- The HSE coordinator shall provide necessary information and instructions, as well as providing and arranging training to the workers and supervising them to follow safety rules and safe working procedures strictly.
- Undertaking regular safety and health inspections and audits on-site.
- To obtain Material Safety Data Sheet (MSDS) from suppliers concerning any hazardous substances bring into the site.
- The HSE coordinator shall provide and enforce wearing of effective helmets, and where necessary, safety harnesses, and other personal protective equipment for all employees.
- The HSE coordinator will manage for water usage in every workplace at suitable and easily accessible place for the whole phases.

Table 9.7 Tentative Schedule for OHSE plan

Phases	Activities	Frequency
Preparation, Operation and Demolishing /Closure Phases	Machineries Safety Training	Once a year
	Chemical Handling and Storage Training	Once a year
	First Aid Training	Once a year
	Basic Fire Fighting Training	Once a year

	Annual Health Examination	Once a year

9.6 COMMUNITY HEALTH AND SAFETY PLAN

This community health and safety plan is intended to improve environment conditions which affect the surrounding communities. This can be placed in safe condition by adopting the following measures for prevention of accidents and hazards.

(a) Community Diseases

- Developing and implementing the health awareness training
- Providing health services of community health clinic
- Promoting collaboration with local authorities to enhance the awareness of public health services and facilities to the workers' families and community

(b) Safety and Security

- Trespassing by workers must be prohibited and the appropriate disciplinary action must be taken.
- Access to construction sites must be restricted
- Precaution and warning sign for health and safety risks must be placed around the project site
- Public awareness programmes must be developed to know the potential impacts of clay soil production

9.7 EMERGENCY PREPAREDNESS AND RESPONSE PROCEDURES

Emergency response procedures and systems are those procedures for handling sudden or unexpected emergency situations. These objectives are to:

- Prevent fatalities and injuries to workers
- Protect the environment and people in the community
- Reduce damage to building, stock and equipment,
- Accelerate the resumption of normal operations

The project proponent should prepare an emergency preparedness plan in order to prevent the consequences of natural disasters such as fire, landslide and man-made disasters. The purpose of the Emergency plan is to minimize the danger to life and property in the event of disasters in the clay soil mining operations. The prevention, preparedness and response plan for fire hazards and landslides are described as follows:

9.7.1 Fire Prevention, Preparedness and Response

Oil barrel and diesel will be stored in the project compound for the generator use; without proper storage, there is a high risk of fire hazards. Therefore, the emergency response plan for fire hazards is described as follows:

- Keep using and storage of combustibles to a minimum.
- Store flammable liquids in approved containers in well-ventilated storage areas.

- Smoking is totally prohibited near the storage area of flammable liquids.
- Place oily polishing rags or waste in covered metal cans.
- Store adequate quantity of water for firefighting
- Fire extinguishers should be provided in the project site. It is very effective life-saving tools, if they are used properly. Fire extinguishers come in different varieties. It is important to choose the right kind of extinguishers for putting out different types of fire. Check for the following symbols on the label of fire extinguishers as shown in **Figure 9.2**.

Figure 9.2 Components of a Fire Extinguisher

Fires have been classified into five categories based on the type of fuel as follows:

Table 9.8 Types of Fires

Types of Fires				
A	B	C	D	K
Fire that is burning from wood, rubbish, paper and other ordinary fuels.	Fire that involves flammable liquids, such as petrol, gasoline and paints.	Fire that involves electrical equipment, transformers and electrical appliances.	Fire that is burning from combustible metals such as magnesium and titanium.	Fire stemming from cooking media (vegetable or animal oils and fats, etc.)

Type A, B and C of fires can occur at the mine site during preparation, operation and decommissioning/closure phase. Although there are many kinds of fire extinguishers, the most appropriate fire extinguishers should be used for the clay soil mining operation as shown in **Figure 9.3**.

Extinguisher	Type of fire						
Color	Type	Solids (wood, paper, cloth, etc.)	Flammable Liquids	Flammable Gasses	Electrical Equipment	Cooking Oils & Fats	Special Notes
	Water	Yes	No	No	No	No	Dangerous if used on liquid fires or live electricity
	Foam	Yes	Yes	No	No	Yes	Not practical for home use
	Dry Powder	Yes	Yes	Yes	Yes	No	Safe use up to 1000 voltages.
	Carbon Dioxide (CO_2)	No	Yes	No	Yes	Yes	Safe on high and low voltages.
	Halon	Halon extinguishers are not recommended due to their toxic nature and cause damage to the environment. Existing halon extinguishers will no longer be re-filled and should be replaced with a suitable alternative.					

Figure 9.3 Types of Fire Extinguishers

Table 9.9 Uses of a Fire Extinguisher Properly

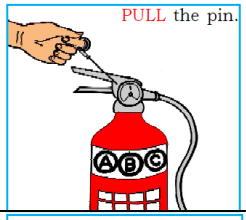
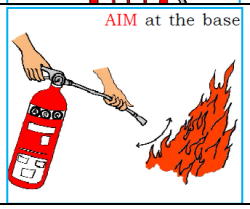
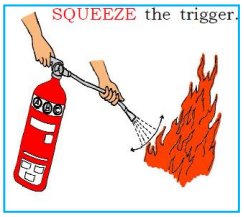
Uses of a fire extinguisher properly Remember the acronym **PASS**.	
	P – Pull the pin- the pin releases a locking mechanism and will allow you to discharge the extinguisher.
	A - Aim at the base-not the flames. This is important- in order to put out the fire, you must extinguish the fuel.
	S – Squeeze the trigger – this will release the extinguishing agent in the extinguisher. If the handle is released, the discharge will stop.
	S – Sweep from side to side – using a sweeping motion, move the fire extinguisher back and forth until the fire is completely out. Operate the extinguisher from a safe distance, several feet away, and then move towards the fire once it starts to diminish. Be sure to read the instructions on your fire extinguisher different fire extinguishers recommend operating them from different distances.

Table 9.10 Safety Tips on Fire

Do's to prevent a fire	Don,ts to prevent a fire
• Keep fire extinguishers in the project site. • Keep a separate water tank for fire extinguishing.	• Do not let children play with fire. • Do not use lamps, candles, etc. near bamboo sheet/ wooden partitions or mosquito nets. • Do not pile hay or corn stems near houses. • Do not use petrol for lighting or start a fire. • Do not store fuel and fuel oil near the fire place. • Do not use ligher or candle light near fuel oil..

9.7.2 Landslide Prevention, Preparedness and Response

Land Conversion can occur due to removal of existing vegetation, large excavation activities and extraction of clay soil in the ground. So, the prevention, preparedness and response plan for a landslide are described as follows:

- Keep records of erosion, landslide masses
- Never construct buildings on the debris without the proper analysis of ground stability and resistance. Loosened masses can subside when load is added to them.
- Try to protect the slopes. Prevent people from excavating, removing materials from the soil or cutting trees without proper advice from the technical experts.
- Avoid building houses at the base of slopes that are prone to landslides.
- Replant trees where they have been removed to prevent soil erosion.
- Prevent deforestation and vegetation removal.
- Avoid weaking the slope.
- Retaining walls efficiently reduce localized landslide hazards, like in the case where cuts into the slopes are needed to build a road or a house as shown in **Figure 9.4**. However, they have to be used with caution because they might also increase the hazard if water in the soil is not allowed to drain properly.
- Proper water runoff must be ensured, especially where houses and roads have disrupted the natural flow patterns. This can be achieved by providing a proper canalization network.
- Drainage: good ground drainage is essential to prevent saturation and consequent weaking.
- Reforestation: Root systems bind materials together and plants, both prevent water percolation and take water percolation and take water up out of the slope. Tree roots help holding the different soil layers together and hinder landslides as shown in **Figure 9.5**.

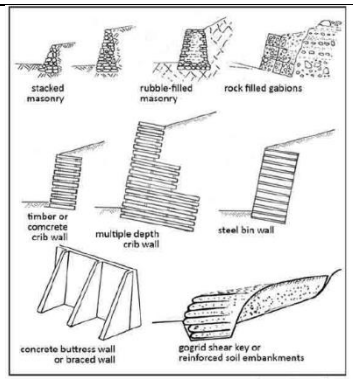


Figure 9.4 Examples of low-cost retaining walls

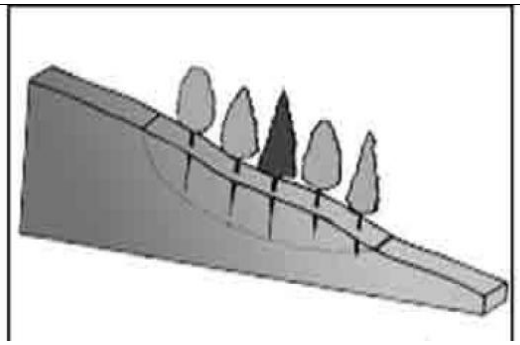


Figure 9.5 Tree roots help holding the different soil layers together and hinder landslide

Table 9. 11Safety Tips on Landslide

Do's to prevent landslide	Don'ts to prevent prevent
• Listen to weather forecasts on the radio, TV about heavy rain. Continuous heavy rainfall within a period of a few hours has the potential to trigger landslides. • Listen for abnormal sounds of soil and rock movement or breaking of trees. They may be associated with landslide movements. • Contact your local authority, village disaster preparedness committee, fire services department, or Myanmar Police Force. Local officials are the best persons who are able to assess potential dangers. • If you are near a stream or channel, be alert for any sudden increase or decrease in water flow and for a change from clear to muddy water. Such changes may indicate debris flow activity upstream, so be prepared to move quickly.	• Do not build near steep slopes, close to mountain edges, near drainage ways or natural erosion valleys. • Never go closer to observe cracks on the slope. If you spot cracks, inform the authorities and move out from the area.

Table 9.12 During Landslide and After a Landslide

During Landslide	After a Landslide
• Quickly move out of the path of the landslide or debris flow. Moving away from the path of the flow to a stable area will reduce your risk. • If escape is not possible, curl into a tight ball and protect your head. A tight ball will provide the best protection for your body.	• Stay away from the slide area. There may be danger of additional slides. • Listen to local radio or television stations for the latest emergency information. • Replant damaged sites as soon as possible since erosion caused by loss of ground cover can lead to flash flooding. • Seek the advice of a geotechnical expert for evaluation landslide hazards or designing corrective techniques to reduce landslide risk. A professional will be able to advise you on the best ways to prevent or reduce landslide risk, without creating further hazard.

9.7.3 Emergency Communications (Kyaikmaraw Township)

All emergency phone numbers should be identified, listed in the emergency preparedness plan and posted each department should display the diagram in a highly visible mine area.

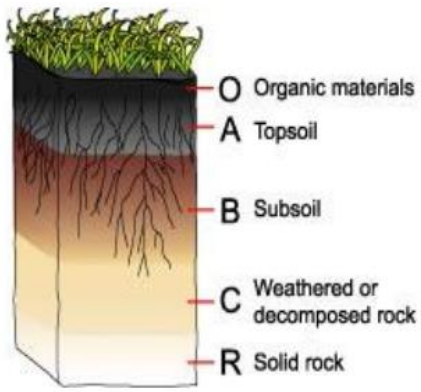
Table 9.13 Emergency Contacts

Department	Phone No.
Fire Brigade	
Central Fire Station	057-86015
POLICE	
Kyaikmaraw Police Station	057-86004
HOSPITAL & AMBULANCE	
General Hospital	057-86008

9.8 TOPSOIL MANAGEMENT PLAN

This Topsoil Management Plan (TMP) has been prepared to demonstrate how topsoil will be preserved in a condition as near as possible to its pre-mining condition in order to allow successful mine rehabilitation. The TMP will include procedures for storage of topsoil during the life of the revised project and appropriate use of topsoil during progressive pit closure and rehabilitation. Topsoil is a finite resource and a vital component of successful rehabilitation.

Existing Topsoil Resources



A Horizon (Topsoil) layer is generally darker than other horizons and may contain decomposed organic materials. Topsoil includes the O layer which contains organic material in varying stages of decomposition. The horizon has the maximum biological activity for any given soil profile. B Horizon (Subsoil) layer has a distinctly different structure or consistency to the A horizon and usually contains a higher clay content. Plant roots penetrate through this layer, although it has very little humus. The A horizon is referred to as 'topsoil' and the B horizon is referred to as 'subsoil'. The topsoil and subsoil will be selectively handled (stripping depth and depth of return) depending on the soil type, and will either be directly returned or stockpiled for later use, which depends on the rehabilitation requirement and the stage of mine development. Topsoil and subsoil stockpile for later use in rehabilitation will require different management during storage and reuse. Subsoil recovery across the revised project site for re-vegetation purpose will be limited due to its general adverse physical nature.

9.8.1 Vegetation and Topsoil Management

Clearing of vegetation should at all times be kept to a minimum to ensure safe working conditions and to conserve the natural vegetation as much as is possible. Vegetation establishment is generally improved by the direct return of topsoil and is considered 'best practice' topsoil management. Suitable topsoil will be stripped for use in the rehabilitation program. All cleared vegetative material may be buried in-pit, or if suitable, placed as habitat within the proposed or current conservation areas. All vegetation is to be collected with the top soil in most proposed project areas this will comprise grasses, to small and medium shrub. Vegetation may be stockpiled separately to topsoil, if necessary due to vegetation causing damage to scrapers on recovery.

Top soil stripping will be undertaken in areas of planned mining activity, the active pit areas, out-of-pit area, haul roads, access roads and other general infrastructures. The topsoil will either be stockpiled until suitable re-contoured areas are available, or preferably be directly returned immediately across the areas to be rehabilitated. Topsoil will be recovered using appropriate equipment. During removal of soils from the stockpiles, take care to minimize structural degradation of the soils. If stockpiling of topsoil cannot be avoid the following should be considered:

- Do not store in large heaps;
- Re-vegetate the stockpile to protect the soil from erosion, discourage weeds and to maintain active populations of beneficial soil microbes;
- Try to avoid using scrapers to build stockpiles as they will compact the soil reducing any biological activity;
- Soils should not be stripped when they are wet as this can lead to compaction and loss of structure;
- Stockpile location must be signposted "TOPSOIL STOCKPILE" and;
- Topsoil stockpiles must be located in a separate planned location. They must not be used for roads, bunds or windrows.

The performance outcomes for the TMP are:

- Soil survey is conducted prior to stripping
- Soil stripping is scheduled to minimize exposed areas
- Soil materials suitable for reuse are recovered and utilized in an appropriate manner; and
- Procedures are in place detailing methods to be used for the stripping and stockpiling of soils.

Always consult the site manager for advice and direction at the planning stage and throughout the topsoil collection, stockpiling and reuse phases. This TMP will give the best results as it prevents or reduces biological deterioration in the soil.

9.9 MINE CLOSURE PLAN

Mine closure is the process of shutting down mining operations in a clay soil mining area. Mine closure plans are specific to each clay soil mine site, and includes details on how

the June Cement Industry Limited will close out the clay soil mine site, how environmental protection will be achieved, and how the mine site will return to an acceptable state to a pre-arranged land use. The term reclamation, remediation, rehabilitation and etc. are all used to describe mine closure activities that attempt to alter the biological and physical state of a site.

In planning for closure, there are four key objectives that must be considered:

- Protect public health and safety;
- Alleviate or eliminate environmental damage;
- Achieve a productive use of the land, or a return to its original condition or an acceptable alternative; and,
- To the extent achievable, provide for sustainability of social and economic benefits resulting from mine development and operations.

Mine closure activities typically consist of several steps;

- **Shut down**: Once production stops, the number of workers is reduced, and only a small workforce is retained to permanently shut down the mining equipment. The mine owners should provide retaining or early retirement options for their workers before the mine is closed.
- **Decommissioning**: Care should be taken, where processing facilities and equipment, are dismantled, pipelines are drained, equipment parts are cleaned and sold: demolishing of the buildings and warehouse materials, and disposal of waste.
- **Remediation**: The cleanup of the contaminated area to safe levels by removing or isolating contaminants. At clay soil mine site, remediation often consists of isolating contaminated material in storage facilities, domestic waste with clean topsoil, and collecting and treating any contaminated mine water if necessary.
- **Reclamation**: The objective of reclamation is to return the land and watercourses to an acceptable standard of productive use, ensuring that any land forms and structures are stable, and any watercourses are of acceptable water quality. Reclamation typically involves a number of activities such as removing any hazardous materials, reshaping the land, restoring topsoil, and planting native grasses, trees, or ground cover.
- **Rehabilitation**: The existing ecosystem of the project area is a degraded forest ecosystem with some growth of native tree species. A progressive rehabilitation program will be implemented throughout the life of the project and reported in each plan of operations, and will commence when areas become available within the operational land:

  The main features of the progressive rehabilitation process are:
  - Use of suitable topsoil, sourced from stockpiles;
  - Contour ripping as an erosion control measure;
  - Establish a tree nursery
  - Collection of indigenous tree seeds
  - Raise tree seedlings with indigenous species
  - Prepare plan for replanting the mine site.

- Organize labor force
- Site Preparation (digging pits)
- Seeding with an appropriate seed mix (grass, shrub and tree species) prior to the commencement of the wet season to maximize the benefits of subsequent rainfall;
- Planting out
- Application of appropriate fertilizer for plant establishment, if required

The following areas on the clay production mine site will need to be rehabilitated on closure:

- Mine Pit Area
- Topsoil stockpile
- Access Roads and Other Disturbed Areas

Specific rehabilitation plan for these areas, including time frames for rehabilitation works, will be outlined in a Decommissioning and Rehabilitation Plan (to be developed prior to mine closure). The final land use of the project will be both teak plantations (as required by Forest Department) in areas which are currently designated as teak plantation, and native forest for other areas (such as the mine pit). Regularly inspect rehabilitated areas for declaring plants and environmental weeds and control significant weed outbreaks using chemical or mechanical control methods. Regularly inspect and maintain rehabilitation areas to facilitate sediment and erosion control and re-vegetation success.

Top Soil Resource

During the initial clearing works, topsoil and vegetation will be stockpiled adjacent to mine-pit areas for later use in rehabilitation. Stockpiled topsoil and soil will be backfilled in mine pit areas and drainage reinstated to its original state. Plantations will be re-established together with other valuable hardwood species.

- **Mine Pit Area**

Due to the reactive nature of the clayey sand and clay, the pit design and mining schedule will aim to minimize and delay exposure of this material within the pit wall where possible. The final mine pit will be left as a fish pond. Water quality will be monitored to ensure as healthy pond. If the situation is not effective, appropriate treatment will be implemented.

- **Topsoil stockpile**

The surface of the topsoil stockpile will be capped with stockpile topsoil and re-vegetated by valuable hardwood plantations after consultation with the Forest Department.

- **Access Roads and Other Disturbed Areas**

These will be ripped and capped with clays and top soil and re-vegetated by hardwood plantation as required by the Forest Department. As any buildings and amenities on site will be demolished, these can simply be removed upon closure and the cleared areas re-vegetated.

- **Post-Closure**: Monitoring programs should be used to assess the effectiveness of the reclamation measures. In addition, mines may require long-term care and maintenance after mine closure such as an ongoing treatment of mine discharge water and periodic monitoring, etc.

Technical audits and reviews of mine closure plans and activities are often completed by professional specialists, government agencies and review committees in order review the safety, stability and environmental risks at mine sites.

9.10 CORPORATE SOCIAL RESPONSIBILITY (CSR) PLAN

June Cement Industry Limited implements Corporate Social Responsibility (CSR) plan together with EMP during its 30 years operation period. The objective of this plan is to create social welfare of miners and the local community, and to prove that the establishment of proposed extraction of the clay soil. Even though the project proponent participates in implementation of CSR plan using 2% of the net profit starting from the very first year of the project, the company focuses more on regional development. A CSR plan formulated for the proposed project can be described in **Table 9.14**.

June Cement Industry Limited has planned the commitments with Environmental Conservation Department under the Ministry of Natural Resource and Environmental Conservation (MONREC) as attached in **Appendix 9**.

Table 9. 14 Corporate Social Responsibility Plan

No.	Activity	Responsible Company	Frequency	Estimated Amount (% of Net Profit)
1.	All around development in schools	June Cement Industry Limited	Annually	0.4%
2.	Contribution to communication	June Cement Industry Limited	Annually	0.4%
3.	Contribution to employees for health and wellbeing, retirement planning, training and development, social welfare	June Cement Industry Limited	Annually	0.8%
4.	Contribution to regional development	June Cement Industry Limited	Annually	0.4%
Total				**2.0%**

9.11 COMMUNITY GRIEVANCE REDRESS MECHANISM

People who live in the project effective area or stakeholders can complain about the impacts that they suffer though Grievance Committee, which includes the responsible persons of June Cement Industry Limited, quarter administrator and representative of Township Fire Department. Small issues are solved at the Grievance Committee stage and other unresolved problems are submitted to higher responsible authorities and finally decided by the court in

legal terms. The following diagram show steps of Grievance Redress Mechanism of June Cement Industry Limited.

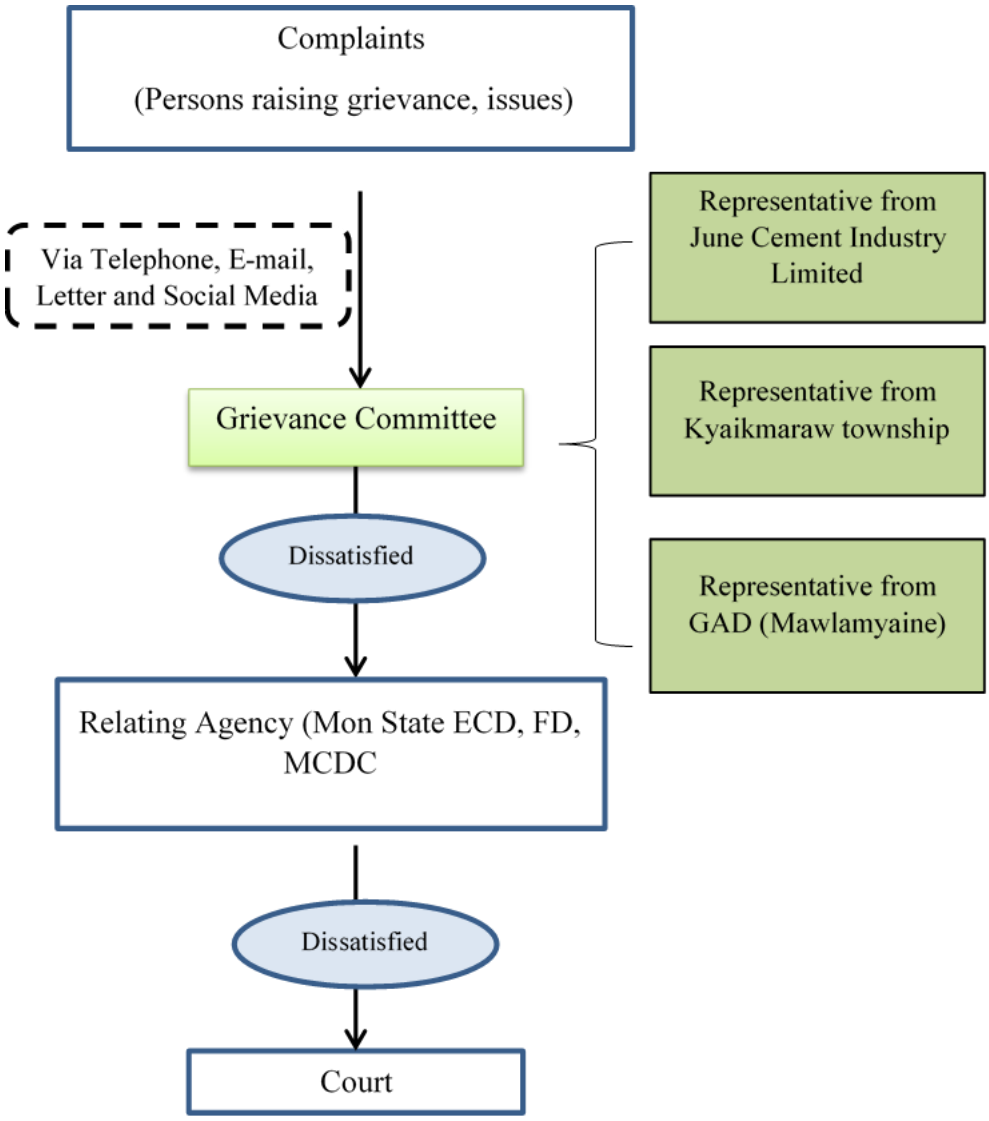


Figure 9.6 Steps of Grievance Redress Mechanism of June Cement Industry Limited

CHAPTER 10

CONCLUSIONS AND RECOMMENDATIONS

10.1 CONCLUSION

This Initial Environmental Examination (IEE) Report and Environmental Management Plan (EMP) was prepared by E Guard Environmental Services for Clay soil production proposed by June Cement Industry Limited. The main objective of the study is to identify the major environmental impacts due to the implementation of the project activities in all three phases (preparation phase, operation phase and decommissioning phase). Initial Environmental Examination (IEE) has been conducted for the proposed project under the Environmental Impact Assessment Procedure as per the comments of Environmental Conservation Department (ECD). The project proponent has to implement the proposed project in compliance with the National laws and regulations for environmental protection.

In this IEE report study, baseline environmental data collection and site visit activities conducted on 12th March, 2019. According to the data interpretation for ambient air quality, noise level, water quality results were compared with National and Environmental Quality (emission) guideline and international guideline standards. According to the observed data, dust level of PM10 is within the guideline value but PM 2.5 is exceeding the guideline value. Dust concentration and Ozone level may high during summer seasons. Other gases are within the limit of guideline values. Noise level and water quality results are also within the acceptable limit of guideline values. As soil laboratory results, Heavy metal contaminants of Irons (Fe), Arsenic (As) and micro nutrient contaminant of Zinc (Zn) were exceeding the (FAO) guideline and other results ate within the limit of (FAO) guideline.

This project can create job opportunities for local people in all three phases. The assessment of each impact is based on consideration of the magnitude, duration, extent and probability of activities which are going to be carried out during preparation, operation and decommissioning phases. The impacts for the environment are mostly low during the implementation of the project. All of the impacts during preparation, operation and decommissioning phases can be minimized by using mitigation measures and implementing Environmental Management Plan.

Environmental Monitoring Plan (EMOP) must need to implement for monitoring the environmental quality of the proposed project. Then, the estimated budget need for implementing Environmental Management Plan and Environmental Monitoring Plan are mentioned in this report. Moreover, CSR plan, firefighting plan, emergency preparedness and response plan, mine closure plan and grievance redress mechanism to solve the complaints related with the proposed project are also described in this report. It is also necessary to consider every opinion of all stakeholder potential to be affected by the development of the proposed project.

10.2 RECOMMENDATIONS FOR FUTURE WORKS

The following recommendations have been made for efficient and effective implementation of environmental conservation, health and safety and social responsibilities through the lifespan of the proposed project.

- ✓ Follow the comments and suggestions made by ECD after reviewing this IEE report.
- ✓ Once EMP is approved by concerned authorities, strict implementation is essential.
- ✓ For full and proper implementation of EMP, well understanding and supports by proponent and authority is deem necessity.
- ✓ Well experienced and knowledgeable HSE Manager and HSE Assistants shall be appointed.
- ✓ Daily, monthly and annual action plan shall be formulated based on this EMP and practiced at operation level.
- ✓ Necessary care and environmentally sound practices should be taken for activities out of factory site particularly on raw material collection and transport.
- ✓ Keep full records of environmental management activities and present to annual independent third-party environment audit.
- ✓ Follow the audit report and comments.
- ✓ Abide environmental policy, laws, rules and instructions of the Republic of the Union of Myanmar.
- ✓ Implement Grievance Redress Mechanism (GRM) to solve the complaints and Corporate Social Responsibility (CSR) plan.
- ✓ Implement EMP and EMOP for balancing development and environmental conservation

Finally, the proponent should follow the comments and suggestions made by ECD after reviewing this IEE report. Once EMP is approved by concerned authorities, effective implementation of EMP by the project proponent is essential. The proponent should abide environmental policy, laws, rules and instructions of the Republic of the Union of Myanmar.

10.3 Disclosing of Initial Environmental Examination (IEE) for Clay Soil Production Project

အများပြည်သူလေ့လာသုံးသပ်အကြံပြုနိုင်ရန် ဖြန့်ဝေထားရှိမှုအစီအစဉ်

June Cement Industry Limited ၏ ရွှံ့စေးမြေတူးဖော်ထုတ်လုပ်ခြင်းလုပ်ငန်းနှင့် ပတ်သက်၍ ရေးသားပြုစုထားသော ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်းအစီရင်ခံစာ (IEE) အား အများပြည်သူများ ဝင်ရောက်လေ့လာသုံးသပ်၍ အကြံပြုချက်များပေးနိုင်ပါရန် အောက်ပါနေရာများတွင် ဖြန့်ဝေပေးပို့ထားရှိပါသည်။

၁။ အမှတ် (၂၁-က)၊ တောင်ဝိုင်းလမ်း၊ ပဲဆီရုံ ကုံးထိပ်၊ ဈေးကျွိုရပ်၊ မော်လမြိုင်မြို့

၂။ အီးဂတ်ပတ်ဝန်းကျင်ဆိုင်ရာဝန်ဆောင်မှုကုမ္ပဏီ၏ ဝက်ဘ်ဆိုဒ်

(http://www.eguardservices.com/disclosure)

၃။ ပြည်ထောင်စုဝန်ကြီးရုံး၊ သယံဇာတနှင့် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာန၊ နေပြည်တော်

၄။ ညွှန်ကြားရေးမှူးချုပ်ရုံး၊ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန၊ နေပြည်တော်

၅။ ညွှန်ကြားရေးမှူးရုံး၊ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန၊ မွန်ပြည်နယ်

၆။ မွန်ပြည်နယ်သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးကော်မတီ

၇။ အမှတ် (၁) သတ္တုလုပ်ငန်း

၈။ ကျိုက်မရောမြို့နယ် အုပ်ချုပ်ရေးမှူးရုံး၊ မွန်ပြည်နယ်

၉။ ကော့ပနောကျေးရွာအုပ်ချုပ်ရေးမှူးရုံး၊ ကျိုက်မရောမြို့နယ်၊ မွန်ပြည်နယ်

References

International Finance Corporation, 2007. Environmental, Health and Safety Guidelines: Construction and Decommissioning, World Bank Group.

International Finance Corporation, 2007. Environmental, Health and Safety Guidelines: Occupational Health and Safety, World Bank Group.

International Finance Corporation, 2007. Environmental, Health and Safety Guidelines: General, World Bank Group.

International Finance Corporation, 2007. Environmental, Health, and Safety Guidelines for Mining, World Bank Group.

World Health Organization, 2010. WHO guidelines for indoor air quality: selected pollutants, regional office for Europe.

National Environmental Quality (Emission), 2015. NEQ Guidelines

Environmental Management Plan for M/s. Velchal Clay soil Quarry Prepared by SRI SAI MANASA NATURETECH PVT .LTD Hyderabad

Environmental Management Plan for Mining Clay soil Prepared by M/s G. Bal Reddy

APPENDIX 1- Surface Water Quality Laboratory Result (1)

ISO TECH LABORATORY

Laboratory Technical Consultant: U Saw Christopher Maung
B.Sc Engg: (Civil), Dip S.E(Delft) Lecturer of YIT (Retd), Consultant (Y.C.D.C), LWSE 001,
Former Member (UNICEF, Water quality monitoring & Surveillance Myanmar)

WTL-RE-001
Issue Date - 01-12-2012
Effective Date - 01-12-2012
Issue No - 1.0/Page 1 of 2

W0319 590

WATER QUALITY TEST RESULTS FORM

Client	Clay
Nature of Water	Surface Water
Location	Kyeikmayaw Township
Date and Time of collection	17.3.2019
Date and Time of arrival at Laboratory	18.3.2019
Date and Time of commencing examination	19.3.2019
Date and Time of completing	24.3.2019

Results of Water Analysis		WHO Drinking Water Guideline (Geneva - 1993)
pH	7.2	6.5 - 8.5
Colour (True)	TCU	15 TCU
Turbidity	NTU	5 NTU
Conductivity	micro S/cm	
Total Hardness	mg/l as $CaCO_3$	500 mg/l as $CaCO_3$
Calcium Hardness	mg/l as $CaCO_3$	
Magnesium Hardness	mg/l as $CaCO_3$	
Total Alkalinity	mg/l as $CaCO_3$	
Phenolphthalein Alkalinity	mg/l as $CaCO_3$	
Carbonate ($CaCO_3$)	mg/l as $CaCO_3$	
Bicarbonate (HCO_3)	mg/l as $CaCO_3$	
Iron	mg/l	0.3 mg/l
Chloride (as CL)	mg/l	250 mg/l
Sodium chloride (as NaCL)	mg/l	
Sulphate (as SO_4)	mg/l	500 mg/l
Total Solids	mg/l	1500 mg/l
Suspended Solids	mg/l	
Dissolved Solids	mg/l	1000 mg/l
Manganese	mg/l	0.05 mg/l
Phosphate	mg/l	
Phenolphthalein Acidity	mg/l	
Methyl Orange Acidity	mg/l	
Salinity	ppt	

Remark: This certificate is issued only for the receipt of the test sample.

Tested by
Signature: Zaw Hein Oo
Name: B.Sc (Chemistry)
Sr. Chemist
ISO TECH Laboratory

Approved by
Signature: Soe Thit
Name: B.E (Civil) 1980,
Technical Officer
ISO TECH Laboratory

(a division of WEG Co.,Ltd.)

No.18, Lanthit Road, Nanthargone Quarter, Insein Township, Yangon, Myanmar.
Ph: 01-640955, 09-73225175, 09-30339681, 01-644506, E-mail: isotechlaboratory@gmail.com, Website: weg-myanmar.com

ISO TECH LABORATORY

Laboratory Technical Consultant: U Saw Christopher Maung
B.Sc Engg: (Civil), Dip S.E(Delft) Lecturer of YIT (Retd), Consultant (Y.C.D.C), LWSE 001.
Former Member (UNICEF, Water quality monitoring & Surveillance Myanmar)

W0319 590

WATER QUALITY TEST RESULTS FORM

Client	Clay
Nature of Water	Surface Water
Location	Kyeikmayaw Township
Date and Time of collection	17.3.2019
Date and Time of arrival at Laboratory	18.3.2019
Date and Time of commencing examination	19.3.2019
Date and Time of completing	24.3.2019

Results of Water Analysis

			WHO Drinking Water Guideline (Geneva - 1993)
Temperature (°C)		°C	
Fluoride (F)		mg/l	1.5 mg/l
Lead (as Pb)		mg/l	0.01 mg/l
Arsenic (As)		mg/l	0.01 mg/l
Nitrate ($N.NO_3$)		mg/l	50 mg/l
Chlorine (Residual)		mg/l	
Ammonia (NH_3)		mg/l	
Ammonium (NH_4)		mg/l	
Dissolved Oxygen (DO)		mg/l	
Chemical Oxygen Demand (COD)	32	mg/l	
Biochemical Oxygen Demand (BOD) (5 days at 20 °C)	8	mg/l	
Cyanide (CN)		mg/l	0.07 mg/l
Zinc (Zn)		mg/l	3 mg/l
Copper (Cu)		mg/l	2 mg/l
Silica (Si)		mg/l	

Remark: This certificate is issued only for the receipt of the test sample.

Tested by

Signature:
Name: Zaw Hein Oo
B.Sc (Chemistry)
Sr. Chemist
ISO TECH Laboratory

Approved by

Signature:
Name: Soe Thit
B.E (Civil) 1980,
Technical Officer
ISO TECH Laboratory

(a division of WEG Co.,Ltd.)
No.18. Lanthit Road, Nanthargone Quarter, Insein Township, Yangon, Myanmar.
Ph: 01-640955, 09-73225175, 09-30339681, 01-644506, E-mail: isotechlaboratory@gmail.com, Website: weg-myanmar.com

SGS

ANALYSIS REPORT

ORIGINAL

Job Ref: 2000391/19
Date: 25/03/2019
Page 1 of 1

Sample Described as	:	**Waste Water**
Client Name	:	**Clay Production Project**
Sample Received Date	:	18. March .2019
Sample Brought By	:	Client
Sample Marking	:	GW
Sample Location	:	Kyaik Ma Yaw
Analysed Date	:	19. March .2019
Lab Code No.	:	093/19

No.	Test Parameter	Method	LOQ	Unit	Result
1	Total Suspended Solid	Standard methods for the examination of water & waste water APHA ,AWWA & WEF,22nd ed, 2012; 2540-D.Dried at 103-105 °C	20	mg/L	46
2	Total Nitrogen	Standard methods for the examination of water & waste water APHA ,AWWA & WEF,22nd ed, 2012; 4500-N_{org} B.Macro Kjeldahl Method	1	mg/L	<1
3	Total Phosphrous	Standard methods for the examination of water & waste water APHA ,AWWA & WEF,22nd ed, 2012;4500-P E.Ascorbic Acid Method	0.01	mg/L	<0.01
4	Oil & Grease	Standard methods for the examination of water & waste water APHA ,AWWA & WEF,22nd ed, 2012;5520B	5	mg/L	<5

********** End of Report **********

SGS (Myanmar) Limited

(Nu Nu Yi)
Manager

APPENDIX 2- Surface Water Quality Laboratory Result (2)

ISO TECH LABORATORY

ISO-TECH LABORATORY

ISO 9001:2015 Cert. No. 688600

Laboratory Technical Consultant: U Saw Christopher Maung
B.Sc Engg: (Civil), Dip S.E(Delft) Lecturer of YIT (Retd). Consultant (Y.C.D.C), LWSE 001.
Former Member (UNICEF, Water quality monitoring & Surveillance Myanmar)

WTL-RE-001
Issue Date - 01-12-2012
Effective Date - 01-12-2012
Issue No - 1.0/Page 2 of 2

W0319 586

WATER QUALITY TEST RESULTS FORM

Client	Limestone Quarry
Nature of Water	Surface Water
Location	Kyeikmayaw Township
Date and Time of collection	17.3.2019
Date and Time of arrival at Laboratory	18.3.2019
Date and Time of commencing examination	19.3.2019
Date and Time of completing	24.3.2019

Results of Water Analysis

			WHO Drinking Water Guideline (Geneva - 1993)
Temperature (°C)	25.0	°C	
Fluoride (F)		mg/l	1.5 mg/l
Lead (as Pb)		mg/l	0.01 mg/l
Arsenic (As)		mg/l	0.01 mg/l
Nitrate ($N.NO_3$)	0.3	mg/l	50 mg/l
Chlorine (Residual)		mg/l	
Ammonia (NH_3)		mg/l	
Ammonium (NH_4)		mg/l	
Dissolved Oxygen (DO)	5.4	mg/l	
Chemical Oxygen Demand (COD)		mg/l	
Biochemical Oxygen Demand (BOD) (5 days at 20 °C)	16	mg/l	
Cyanide (CN)		mg/l	0.07 mg/l
Zinc (Zn)		mg/l	3 mg/l
Copper (Cu)		mg/l	2 mg/l
Silica (Si)		mg/l	

Remark: This certificate is issued only for the receipt of the test sample.

Tested by

Signature: Hein

Name: Zaw Hein Oo
B.Sc (Chemistry)
Sr. Chemist
ISO TECH Laboratory

Approved by

Signature: Soe Thit

Name: Soe Thit
B.E (Civil) 1980,
Technical Officer
ISO TECH Laboratory

(a division of WEG Co.,Ltd.)
No.18. Lanthit Road, Nanthargone Quarter, Insein Township, Yangon, Myanmar.
Ph: 01-640955, 09-73225175, 09-30339681, 01-644506, E-mail: isotechlaboratory@gmail.com, Website: weg-myanmar.com

ISO TECH LABORATORY

ISO 9001:2015 Cert. No. 688600

Laboratory Technical Consultant: U Saw Christopher Maung
B.Sc Engg: (Civil), Dip S.E(Delft) Lecturer of YIT (Retd). Consultant (Y.C.D.C), LWSE 001.
Former Member (UNICEF, Water quality monitoring & Surveillance Myanmar)

WTL-RE-001
Issue Date - 01-12-2012
Effective Date - 01-12-2012
Issue No - 1.0/Page 1 of 2

W0319 586

WATER QUALITY TEST RESULTS FORM

Client	Limestone Quarry
Nature of Water	Surface Water
Location	Kyeikmayaw Township
Date and Time of collection	17.3.2019
Date and Time of arrival at Laboratory	18.3.2019
Date and Time of commencing examination	19.3.2019
Date and Time of completing	24.3.2019

Results of Water Analysis

			WHO Drinking Water Guideline (Geneva - 1993)
pH	7.6		6.5 - 8.5
Colour (True)		TCU	15 TCU
Turbidity	330	NTU	5 NTU
Conductivity		micro S/cm	
Total Hardness		mg/l as $CaCO_3$	500 mg/l as $CaCO_3$
Calcium Hardness		mg/l as $CaCO_3$	
Magnesium Hardness		mg/l as $CaCO_3$	
Total Alkalinity		mg/l as $CaCO_3$	
Phenolphthalein Alkalinity		mg/l as $CaCO_3$	
Carbonate ($CaCO_3$)		mg/l as $CaCO_3$	
Bicarbonate (HCO_3)		mg/l as $CaCO_3$	
Iron		mg/l	0.3 mg/l
Chloride (as CL)		mg/l	250 mg/l
Sodium chloride (as NaCL)		mg/l	
Sulphate (as SO_4)		mg/l	500 mg/l
Total Solids		mg/l	1500 mg/l
Suspended Solids		mg/l	
Dissolved Solids		mg/l	1000 mg/l
Manganese		mg/l	0.05 mg/l
Phosphate	Nil	mg/l	
Phenolphthalein Acidity		mg/l	
Methyl Orange Acidity		mg/l	
Salinity	0.1	ppt	

Remark: This certificate is issued only for the receipt of the test sample.

Tested by
Signature:
Name: Zaw Hein Oo
B.Sc (Chemistry)
Sr. Chemist
ISO TECH Laboratory

Approved by
Signature:
Name: Soe Thit
B.E (Civil) 1980,
Technical Officer
ISO TECH Laboratory

(a division of WEG Co.,Ltd.)
No.18. Lanthit Road, Nanthargone Quarter, Insein Township, Yangon, Myanmar.
Ph: 01-640955, 09-73225175, 09-30339681, 01-644506, E-mail: isotechlaboratory@gmail.com, Website: weg-myanmar.com

ISO TECH LABORATORY

ISO 9001:2015 Cert. No. 688600

Laboratory Technical Consultant: U Saw Christopher Maung
B.Sc Engg: (Civil), Dip S.E(Delft) Lecturer of YIT (Retd). Consultant (Y.C.D.C), LWSE 001.
Former Member (UNICEF, Water quality monitoring & Surveillance Myanmar)

WTL-RE-001
Issue Date - 01-1-2016
Effective Date - 01-1-2016
Issue No - 1.0/Page 1 of 1

M0319 052

WATER QUALITY TEST (MICROBIOLOGY) RESULTS FORM

Client: Limestone Quarry
Nature of Water: Surface Water
Location: Kyeikmayaw Township
Date and Time of collection: 17.3.2019
Date and Time of arrival at Laboratory: 18.3.2019
Date and Time of commencing examination: 18.3.2019
Date and Time of completing: 19.3.2019

Results of Water Analysis

			WHO Drinking Water Guideline (Geneva - 1993)
Total Coliform Count	18	CFU/100ml	Not detected
Thermotolerant (fecal) Coliform Count	4	CFU/100ml	Not detected
pH	7.6		6.5 - 8.5
Turbidity	330	NTU	5 NTU
Colour (True)	120	TCU	15 TCU
Free Chlorine	Nil	mg/l	
Total Chlorine	Nil	mg/l	

Remark : Unsatisfactory for drinking purpose.

: This certificate is issued only for the receipt of the test sample.

: < - Less than

Tested by

Signature: Hein
Name: Zaw Hein Oo
B.Sc (Chemistry)
Sr. Chemist
ISO TECH Laboratory

Approved by

Signature:
Name: Soe Thit
B.E (Civil) 1980,
Technical Officer
ISO TECH Laboratory

(a division of WEG Co.,Ltd.)
No.18. Lanthit Road, Nanthargone Quarter, Insein Township, Yangon, Myanmar.
Ph: 01-640955, 09-73225175, 09-30339681, 01-644506, E-mail: isotechlaboratory@gmail.com, Website: weg-myanmar.com

APPENDIX 3 – Soil Quality Laboratory Result

United Analyst and Engineering Consultant Co., Ltd.
3 Soi Udomsuk 41, Sukhumvit Road, Bangchak, Phrakhanong, Bangkok 10260
Tel. 0 2763 2828 Fax 0 2763 2800 www.uaeconsultant.com E-mail: uae@uaeconsultant.com

ANALYSIS REPORT

PROJECT NAME	:JUNE GROUP (CLAY)		
CUSTOMER NAME	:E-GUARD ENVIRONMENTAL SERVICE CO., LTD		
ADDRESS	:NO.11, AIRPORT AVENUE ROAD YANGON MYANMAR		
CONTACT INFORMATION	:TEL : +97 9700 5170 e-mail : Chue@guardservies.com		
SAMPLING SOURCE	:-		
SAMPLE TYPE	:SOIL	**RECEIVED DATE**	: JUNE 27, 2019
SAMPLING DATE	:JUNE 16, 2019	**ANALYTICAL DATE**	: JUNE 27 - JULY 14, 2019
SAMPLING TIME	:-	**REPORT NO.**	: 2019-U39419
SAMPLING METHOD	:-	**WORK NO.**	: 2019-004631
SAMPLING BY	:CUSTOMER	**ANALYSIS NO.**	: T19AI862-0001
ANALYZED BY	:MISS CHOMTHANAN APHIPATPAPHA		

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT S - 1 T19AI862-0001	DETECTION LIMIT
METALS				
ARSENIC (As)	mg/kg (dry weight)	ACID DIGESTION AND HYDRIDE GENNERATION AAS METHOD (U.S. EPA 1996:3050 B AND 1992:7061 A)	31.1	0.100
CADMIUM (Cd)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1996:3050 B AND 2007:7000 B)	ND	0.300
MERCURY (Hg)	mg/kg (dry weight)	ACID DIGESTION AND COLD VAPOUR AAS METHOD (U.S.EPA 2007:7471 B)	ND	0.100
CHROMIUM (Cr)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1996:3050 B AND 2007:7000 B)	53.9	0.500
COPPER (Cu)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1996:3050 B AND 2007:7000 B)	37.8	0.300
IRON (Fe)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1996:3050 B AND 2007:7000 B)	88,312	0.500
LEAD (Pb)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1996:3050 B AND 2007:7000 B)	38.6	1.55
ZINC (Zn)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1996:3050 B AND 2007:7000 B)	127	0.350
SAMPLE CONDITION			BROWN SOIL	

ND : NON-DETECTABLE.

*United Analyst Engineering Consultant Co., Ltd is Sub-contractor of REM-UAE Laboratory and Consultant Co., Ltd

(MISS BENJAWAN VIRIYOTHAI)
LABORATORY SUPERVISOR

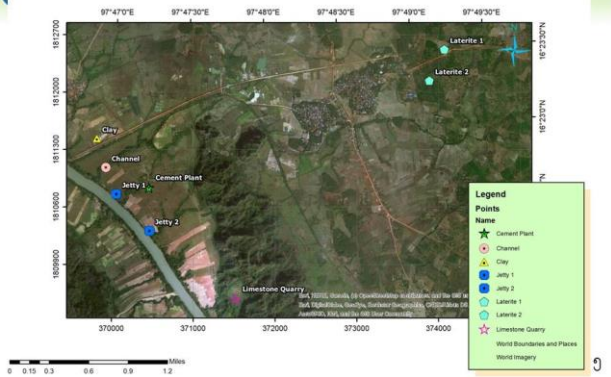
JULY 22, 2019

• DO NOT COPY PARTIAL OF THIS ANALYSIS REPORT WITHOUT OFFICIAL APPROVAL .
• REPORTED ANALYSIS REFERS TO SUBMITTED SAMPLE ONLY.

1/1

APPENDIX 4 – Presentation File

စီမံကိန်းဆိုင်ရာ တည်နေရာများပြပုံ



၅

စီမံကိန်းဆိုင်ရာ အချက်အလက်များ

ဆောက်လုပ်ရေးကာလ	- (၃) နှစ်
ပမာဏ စွန့်ပစ်လေ့လာမှု	- (၁) နှစ်
ရင်းနှီးမြှုပ်နှံမှုကာလ	- နှစ် (၃၀)
စုစုပေါင်းမြေကွက်အကျယ်	- (၈၉၉.၉၆) ဧက
ဝန်ထမ်းအရေအတွက်	- ၇၀၀ ဦး
စီမံကိန်းတည်နေရာ (လတ်တီတွဒ်)	- ၁၆°၂၁'၂၂.၉၃၃"N
လောင်ဂျီတွဒ်	- ၉၇°၄၈'၀၃.၆၅၁"E

၆

စီမံကိန်းအနီးရှိ ကျေးရွာဆိုင်ရာအချက်အလက်များ

စဉ်	ကျေးရွာအမည်	အိမ်ခြေ	အိမ်ထောင်စု	လူဦးရေ		
				ကျား	မ	ပေါင်း
၁။	ကော့ပနော	၄၅၀	၅၀၀	၄၉၂	၅၁၀	၁၀၀၂
၂။	ကော့ဒွန်း	၃၆၉	၄၂၉	၄၃၀	၄၃၅	၈၆၅
၃။	မယ်ကရို့	၂၈၉	၂၉၆	၇၅၉	၈၅၃	၁၆၄၈

၇

လက်ရှိစီမံကိန်း အခြေအနေ


တူးဖြောင်းတည်ဆောက်မည့်နေရာ


ဆိပ်ခံတံတားတည်ဆောက်မည့်နေရာ


ရှုံစေးမြေတူးဖော်မည့်နေရာ


ဂဝံကျောက်တူးဖော်မည့်နေရာ

၈

ဆိပ်ခံတံတား ဒီဇိုင်း

တူမြောင်း ဒီဇိုင်း

၉

ကျေးဇူးတင်ပါသည်။

၁၀

ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်း

(Initial Environmental Examination)

E Guard Environmental Services

၁၁

ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်း

စီမံကိန်း၏ဖြစ်နိုင်ခြေရှိသော အကျိုးသက်ရောက်မှုများ

စစ်ဆေးခြင်း

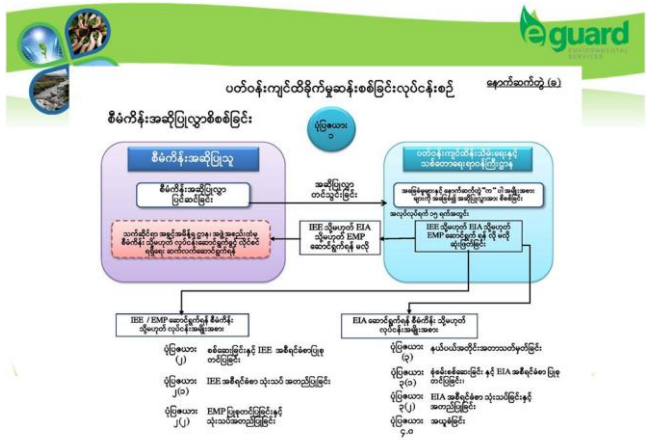
- ✓ သိသာထင်ရှားမှု ရှိ၊ မရှိ
- ✓ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း ဆောင်ရွက်ရန် လိုအပ်ခြင်း ရှိ၊ မရှိ
- ✓ သတ်မှတ်ထားသောအထောက်အထားများ ပြုစုတင်ပြရန်လိုအပ်ခြင်း ရှိ၊ မရှိ

ဆောင်ရွက်သည့်အဖွဲ့ အစည်း - E Guard Environmental Services Co., Ltd.

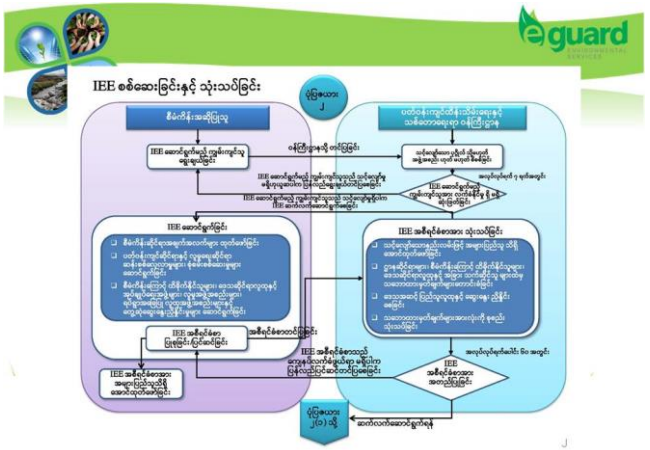
စိစစ်ခွင့်ပြုမည့်အဖွဲ့ အစည်း - သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာန၊ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန

လိုက်နာရမည့် နည်းဥပဒေ၊ စည်းမျဉ်းစည်းကမ်းများ - ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော် ဖွဲ့စည်းပုံအခြေခံဥပဒေ (၂၀၀၈) ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဥပဒေ၊ နည်းဥပဒေနှင့် စည်းမျဉ်းစည်းကမ်းများ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း၊ အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်များ

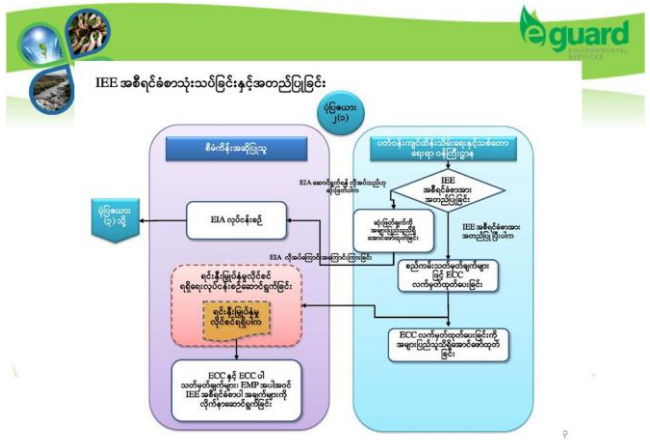
၁၂



၁၃



၁၄



၁၅

ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်း၏ ရည်ရွယ်ချက်များ

- စီမံကိန်းဆောင်ရွက်မှုကြောင့်ဖြစ်ပေါ်လာနိုင်သည့် ပြဿနာရပ်များကို ဖော်ထုတ်ခြင်း
- ထိခိုက်လာနိုင်မှုများကိုလျော့ချပေးနိုင်မည့်အစီအစဉ်များကို အကြံပြုတင်ပြခြင်း
- စောင့်ကြပ်ကြည့်ရှုမည့်အစီအစဉ်များ ကြိုတင်ပြင်ဆင်ပြီးအကောင်ထည်ဖော်ဆောင်ရွက်ခြင်း
- ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်းလုပ်ငန်း လုံလောက်မှု ရှိ/မရှိဆန်းစစ်ခြင်း

အများပြည်သူနှင့် ဆွေးနွေးညှိနှိုင်းသဘောထားရယူခြင်း၏ရည်ရွယ်ချက်များ

- ဖြစ်ပေါ်လာနိုင်သည့် ကောင်းကျိုး/ဆိုးကျိုးများကိုတင်ပြခြင်း
- ပါဝင်ပတ်သက်သူများ၏အမြင်နှင့်အကြံပြုချက်များ၊ ထိခိုက်သက်ရောက်လာနိုင်မှုများကိုလျော့ချပေးနိုင်မည့်အစီအစဉ်များ၊ စောင့်ကြပ်ကြည့်ရှုမည့်အစီအစဉ်များတွင် ထည့်သွင်းစဉ်စားပေးခြင်း
- စီမံကိန်းအကောင်အထည်ဖော်ဆောင်ရွက်ခြင်းနှင့် လည်ပတ်ခြင်း၏ ပွင့်လင်းမြင်သာမှုနှင့် တာဝန်ယူနိုင်မှု တိုးတက်စေခြင်း
- အငြင်းပွားမှုလျော့ချခြင်းနှင့် စီမံကိန်းအကောင်အထည်ဖော်ရာတွင် ချောမွေ့မှုရှိရန်ဆောင်ရွက်ခြင်း

၁၆

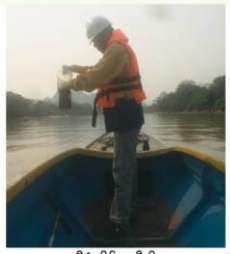
စီမံကိန်းပတ်ဝန်းကျင်လက်ရှိအနေအထား

အတိုင်းအတာများ	ဆိပ်ခံတံတားတည်ဆောက်ခြင်းနှင့် တူးဖြင်းဖောက်လုပ်ခြင်းလုပ်ငန်းများ	ရွှံ့စေးမြှားစော်ခြင်းနှင့် ဂဝံကျောက်ထုတ်လုပ်ခြင်း
လေထုတွင်ဖိုင်းသည့် အမှုန်မာဏ	အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်များထက် အနည်းငယ်များပြား	အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်များထက် အနည်းငယ်များပြား
လေထုတွင်ဖိုင်းသည့် ဓာတ်ငွေ့ဝမာဏ	အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်များအတွင်း	အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်များအတွင်း
ရေအရည်အသွေး	အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်များအတွင်း	အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်များအတွင်း
ဆူညံသံမာဏ	အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်များအတွင်း	အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်များအတွင်း

၁၇

စီမံကိန်းပတ်ဝန်းကျင်လက်ရှိအနေအထားတိုင်းတာခြင်း

စီမံကိန်းအတွင်းလေထုအရည်အသွေး တိုင်းတာနေပုံ



စီမံကိန်းအနီးရှိ ရေနမုန်းကောက်ယူပုံ

၁၈

စီမံကိန်းပတ်ဝန်းကျင်လက်ရှိအနေအထားတိုင်းတာခြင်း

စီမံကိန်းအတွင်းဆူညံသံအဆင့် တိုင်းတာသည်ပုံ

စီမံကိန်းအတွင်းမြေအရည်အသွေး တိုင်းတာသည်ပုံ

၁၉

စီမံကိန်းပတ်ဝန်းကျင်လက်ရှိအနေအထားတိုင်းတာခြင်း

စီမံကိန်းအနီးနှန်းအနည်အနစ်အရည်အသွေးကောက်ယူသည်ပုံ

၂၀

တူးဖြောင်းတူးဖော်ခြင်းနှင့် ဆိပ်ခံတံတားဆောက်လုပ်ခြင်း သက်ရောက်မှုအဆင့်သတ်မှတ်ခြင်း

ထိခိုက်မှု အဆင့်	ထိခိုက်မှု ဖော်ပြချက်	တည်ဆောက်သည့်ကာလ	လုပ်ငန်းလည်ပတ်သည့်ကာလ	စီမံကိန်းပျက်သိမ်းသည့်ကာလ	စုစုပေါင်း
အလွန်နည်း (very low)	လုံးဝသက်ရောက်မှုမရှိသော အနေအထား	-	-	၁	၁
နည်း (low)	သက်ရောက်မှုနည်းပါး	၄	၄	၄	၁၂
အလယ်အလတ် (moderate)	သက်ရောက်မှုအနည်းငယ်ရှိ၍ ကောင်းမွန်စေရေး ဆောင်ရွက်ရန်လိုအပ်	၄	၂	၃	၉
များ (high)	ထင်ရှားသောသက်ရောက်မှုရှိ၍ ကောင်းမွန်စေရေး အမှန်တကယ် ဆောင်ရွက်ရန် လိုအပ်	-	၁	-	၁
အလွန်များ (very high)	ရေရှည်ဆောင်ရွက်ရန် မသင့်တော်သော အနေအထား	-	-	-	-
စုစုပေါင်း		၈	၇	၈	၂၃

ရှုံ့စေးမြေတူးဖော်ခြင်းနှင့် ဂဝံကျောက်တူးဖော်ခြင်း သက်ရောက်မှုအဆင့်သတ်မှတ်ခြင်း

ထိခိုက်မှု အဆင့်	ထိခိုက်မှု ဖော်ပြချက်	တည်ဆောက်သည့်ကာလ	လုပ်ငန်းလည်ပတ်သည့် ကာလ	စီမံကိန်းပျက်သိမ်းသည့် ကာလ	စုစုပေါင်း
အလွန်နည်း (very low)	လုံးဝသက်ရောက်မှုမရှိသော အနေအထား	-	-	-	-
နည်း (low)	သက်ရောက်မှုနည်းပါး	၈	၅	၁၀	၂၃
အလယ်အလတ် (moderate)	သက်ရောက်မှုအနည်းငယ်ရှိ၍ ကောင်းမွန်စေရေး ဆောင်ရွက်ရန်လိုအပ်	၂	၃	-	၅
များ (high)	ထင်ရှားသောသက်ရောက်မှုရှိ၍ ကောင်းမွန်စေရေး အမှန်တကယ် ဆောင်ရွက်ရန် လိုအပ်	-	၂	-	၂
အလွန်များ (very high)	ရေရှည်ဆောင်ရွက်ရန် မသင့်တော်သော အနေအထား	-	-	-	-
စုစုပေါင်း		၁၀	၁၀	၁၀	၃၀

ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်

- စီမံကိန်းအကြိုတည်ဆောက်ခြင်း၊ **(တည်ဆောက်သည့်ကာလ)**
- စီမံကိန်းလည်ပတ်ခြင်း **(လုပ်ငန်းလည်ပတ်သည့် ကာလ)**
- စီမံကိန်းသက်တမ်းကုန်ဆုံး၍ ကုန်ဆုံး၍ ပိတ်သိမ်းခြင်း **(စီမံကိန်းပိတ်သိမ်းသည့်ကာလ)**

ဆိုးကျိုးသက်ရောက်ခြင်းမှ
- ✓ကာကွယ်ရန်
- ✓ရှောင်လွှဲရန်
- ✓လျော့နည်းစေရန်

→ နည်းလမ်းနှင့် အစီအစဉ်များ ဖော်ပြသည့်စီမံချက်

ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်

ဆိုးကျိုးလျော့နည်းစေသည့် အရေးယူဆောင်ရွက်မှုများနှင့်

စောင့်ကြပ်ကြည့်ရှုမည့် အစီအစဉ်

စီမံကိန်းတည်ဆောက်သည့် ကာလ

စဉ်	သက်ရောက်မှု	စီမံကိန်းဆောင်ရွက်ချက်	လျော့နည်းစေရန်အရေးယူဆောင်ရွက်မှု
၁။	မြင်ကွင်းပသာဒ	• အပေါ်ယံမြေဆီလွှာဖယ်ရှားခြင်း။ • သစ်ပင်များခုတ်ထွင်ရှင်းလင်းခြင်းနှင့် မြေရှင်းလင်းခြင်း။	• မြေပြုပြင်ခြင်းအတွက် သစ်ပင်များခုတ်ထွင်ရှင်းလင်းရာတွင် တက်နိုင်သမျှ ပတ်ဝန်းကျင်ထိခိုက်မှု လျော့နည်းအောင်စီစဉ်ဆောင်ရွက်ရန်၊ • ကြီးထွားမှုနှုန်းမြန်ပြီး ဒေသခံမျိုးရင်းပင်များမှ အပင်မျိုးစေ့များနှင့် အပင်ပေါက်များကို ထိန်းသိမ်းထားပြီး လုပ်ကွက်ပြီးဆုံးသည့်ကာလတွင် ပြန်လည်စိုက်ပျိုးပေးခြင်း။
၂။	လေအရည်အသွေး	• မြေများတူးဆွခြင်းနှင့် မြေဖို့ခြင်းလုပ်ငန်း ငန်းများမှ ဖုန်များထွက်ရှိခြင်း။ • သစ်ပင်များခုတ်ထွင်ရှင်းလင်းခြင်းနှင့် မြေရှင်းလင်းခြင်း။ • လုပ်ငန်းသုံးယာဉ်များ သွားလာခြင်း။ • ယာယီအဆောက်အဦး ဆောက်လုပ်ခြင်းနှင့် လမ်းများဖောက်လုပ်ခြင်း။ • ဆောက်လုပ်ရေးသုံး ပစ္စည်းများ သယ်ယူပို့ဆောင်ခြင်းနှင့် စက်ယန္တရားများမှ ဖုန် နှင့် မီးခိုးများထွက်ရှိခြင်း။ • အရေးပေါ်သုံးမီးစက်နှင့် ဂျင်နရေတာ၊ စက်ယန္တရားများအသုံးပြုခြင်းနှင့် ရွေ့လျားသွားလာမှု	• ကောင်းမွန်သည့် စက်ယန္တရားများ အသုံးပြုစေခြင်း။ • လုပ်ငန်းသုံးယဉ်များသွားလာသည့် နေရာတွင် တစ်နေ့လျှင် (၂ကြိမ်) ခန့်ရေဖျန်းပေးခြင်း။ • လုပ်ငန်းခွင်ကာကွယ်ရေးပစ္စည်းများအသုံးပြုစေခြင်း။ • ဆောက်လုပ်ရေးလုပ်ငန်းသုံး ယာဉ်များအား စီမံကိန်းဧရိယာအတွင်း အရှိန်ကို လျှော့ချစေခြင်း • ဆောက်လုပ်ရေးလုပ်ငန်းသုံးယာဉ်များနှင့် စက်ပစ္စည်းများကို ပုံမှန်စစ်ဆေးခြင်း။ • မြေစာပုံများကို ဖုံးအုပ်ခြင်း သို့မဟုတ် ရေဖြန်းခြင်း။
၄။	မြေအရည်အသွေးနှင့် ကုန်းနေဂေဟစနစ်	• အပေါ်ယံမြေဆီလွှာဖယ်ရှားခြင်း နှင့် မြေကြီးတိုက်စားခြင်း။ • သစ်ပင်များခုတ်ထွင်ရှင်းလင်းခြင်းနှင့် မြေရှင်းလင်းခြင်း။ • လုပ်ငန်းသုံး ယာဉ်ယန္တရားများ၊ စက်များ နှင့် ဆီသိုလှောင်သောနေရာမှ ဆီများယိုဖိတ်ခြင်း။ • မြေတူးစက်ဖြင့်မြေတူးခြင်းကြောင့် မြေပြောင်းလဲခြင်း။	• လုပ်ငန်းပြင်ဆင်ခြင်းဆောင်ရွက်သည့်ကာလတွင် အပေါ်ယံမြေဆီလွှာများကို ဖယ်ရှား၍ လုပ်ကွက်တွင်းစနစ်တကျစုပုံထားခြင်း။ • မိုးရာသီတွင် မြေတူးလုပ်ငန်းများကို တတ်နိုင်သမျှ မဆောင်ရွက်ခြင်း။ • သတိပေးဆိုင်းဘုတ်စိုက်ထူခြင်းနှင့် ခြံစည်းရိုးကာခြင်း။ • သတ်မှတ်ထားသောလုပ်ကွက်ဧရိယာတွင်း ဆောင်ရွက်ခြင်း။ • မြေတူး စက်ယန္တရားများကို ပုံမှန် စစ်ဆေးခြင်း။ • ဆီစစ်သံကန်များအသုံးပြုခြင်း။ • ကောင်းမွန်သောဆီပေပါများ အသုံးပြုခြင်း။ • စက်ပစ္စည်းများ ပြုပြင်ထိန်းသိမ်းရန် နေရာအား ကွန်ကရစ်ခင်းပြီး သီးသန့်နေရာအဖြစ် သတ်မှတ်ထားရှိခြင်း။
၅။	ရေအရည်အသွေးနှင့် ရေနေဂေဟစနစ်	• မိုးတွင်းကာလမြေရှင်းလင်းခြင်းနှင့် မြေတူးဖော်ခြင်း။ • သစ်ပင်များခုတ်ထွင်ရှင်းလင်းခြင်း။ • အပေါ်ယံမြေဆီလွှာများကို စုပုံထားခြင်းမှ မြေအောက်ရေယိုစိမ့်မှုဖြစ်ခြင်း။ • စက်ယန္တရားများမှဆီယိုဖိတ်ခြင်း။ • တူးမြောင်းဖောက်လုပ်ခြင်းလုပ်ငန်းများ	• ရေစီးရေလာကောင်းမွန်စေရန် ရေနုတ်မြောင်းများဖောက်လုပ်ထားခြင်း။ • လုပ်ငန်းသုံးယာဉ်များနှင့် စက်ပစ္စည်းများကို ပုံမှန်စစ်ဆေးခြင်း။ • အန္တရာယ်ဖြစ်စေမည့် ပစ္စည်းများကို ရေထဲသို့ မပစ်ရန် တားမြစ်ထားခြင်း။ • စက်ပစ္စည်းများကို သတ်မှတ်ဧရိယာ အတွင်းတွင် ပြင်ဆင်ခြင်း။ • တူးမြောင်းတည်ဆောက်ရေးလုပ်ငန်းခွင်မှ စွန့်ပစ်ရေများ အတွင်းမြစ်အတွင်း မဝင်ရောက်စေရန် ယာယီရေတားတမံ တည်ဆောက်ခြင်း။

စဉ်	သက်ရောက်မှု	စီမံကိန်းဆောင်ရွက်ချက်	လျော့နည်းစေရန်အရေးယူ ဆောင်ရွက်မှု
၃။	ဆူညံသံ နှင့် တုန်ခါမှု	• လုပ်ငန်းသုံးယာဉ်များမှ အပေါ်ယံမြေဆီလွှာဖယ်ရှားခြင်း၊ မြေရှင်းလင်းခြင်း နှင့် သစ်ပင်များခုတ်ထွင်ရှင်းလင်းခြင်းဆူညံသံမျ ား ထွက်ရှိခြင်း။ • ဆောက်လုပ်ရေးလုပ်ငန်းခွင်တွ င်အသုံးပြုသော စက်ပစ္စည်းများ၊ မီးစက်များ၊ ယာဉ်များ၊ မြေတူးခြင်း မှ တုန်ခါမှု နှင့် ဆူညံသံများ ထွက်ရှိခြင်း။ • ဆောက်လုပ်ရေးလုပ်ငန်းများဖြစ်သည့် ဂဟေဆက်ခြင်း၊ လွန်ဖောက်ခြင်း၊ တူရိုက်ခြင်းများမှ ဆူညံသံထွက်ပေါ်ခြင်း။ • အရေးပေါ်မီးစက်များ အသုံး ပြုခြင်း။	• သတ်မှတ်ထားသောအလုပ်ချိန်အတိုင်း လုပ်ငန်းဆောင်ရွက်ခြင်း။ • လုပ်ငန်းသုံးယာဉ်များနှင့် စက်ပစ္စည်းများကို ပုံမှန်စစ်ဆေးခြင်း။ • မီးစက်များကို အကာအရံများအတွင်း ထားရှိခြင်း။ • ဆူညံသံကျယ်လောင်စွာ ထွက်နိုင်သော လုပ်ငန်းများ ဆောင်ရွက်ချိန်တွင် လုပ်ငန်းခွင်ကာကွယ်ရေးပစ္စည်းများ အသုံးပြုစေခြင်း။ • လုပ်ငန်းသုံးကားများကို အမြန်နှုန်းသတ်မှတ်ထားခြင်း။ • ပစ္စည်းများအတင်အချလုပ်စဉ် ယာဉ်များ၏စက်များကို ရပ်ထားခြင်း။
၆။	စွန့်ပစ်ပစ္စည်း (အစိုင်အခဲနှင့် အရည်)	• အပေါ်ယံမြေဆီလွှာဖယ်ရှားခြင်း၊ • အလုပ်သမားများမှ တစ်ကိုယ်ရေသုံးစွန့်ပစ်အမှိုက်များ (ပလတ်စတစ်၊ ပုလင်း)၊ • အလုပ်သမားများ အသုံးပြုသော သန့်စင်ခန်းများမှစွန့်ပစ်အရည်များ။ • လုပ်ငန်းသုံး ယာဉ်များနှင့် စက်များမှ အန္တရာယ်ဖြစ်စေသော အသုံးပြုပြီး စက်သုံးဆီများနှင့် ဆီသိုလှောင်မှု အားနည်းမှုကြောင့် ဆီယိုဖိတ်ခြင်း။ • အခြားသောအသုံးပြုပြီး ပစ္စည်းများ ဖြစ်သည့် သံတိုသံစများ၊ ဘိလပ်မြေ အိတ်ခွံများ၊ သုတ်ဆေးဘူးခွံ၊ မှန်ကွဲများစသည့် အစိုင်အခဲစွန့်ပစ် ပစ္စည်းများ။ • မြေတူးခြင်းမှ ထွက်ရှိသောမြေများ နှင့် ထိုမြေများကိုသယ်ရာတွင် လမ်းပေါ်တွင် စွန့်ပစ်မြေများပြုတ်ကျခြင်း ။	• စီမံကိန်းအတွင်းအသုံးပြုပြီး စွန့်ပစ်ပစ္စည်းများစွန့်ပစ်ရန် အမှိုက်ပုံးများထားရှိခြင်း၊ • အပေါ်ယံမြေဆီလွှာစုပုံသည့် နေရာ သတ်မှတ်ခြင်း။ • စွန့်ပစ်ပစ္စည်းများထဲမှ ပြန်လည်အသုံးပြုနိုင်သော ပစ္စည်းများအား ပြန်လည်အသုံးပြုခြင်း၊ • အလုပ်သမားများအတွက် လုံလောက်သော အိမ်သာများ ထားရှိပေးခြင်း။ • အန္တရာယ်ရှိစွန့်ပစ်ပစ္စည်းများ၊ အသုံးပြုပြီးဆီများအား ဆီစစ်သံကန်များ အသုံးပြုပြီး သိုလှောင်ခြင်း။ • စီမံကိန်းဧရိယာအတွင်း စွန့်ပစ်ပစ္စည်းများ စုပုံရန်ယာယီနေရာ သတ်မှတ်ခြင်း။ • အန္တရာယ်ရှိစွန့်ပစ်ပစ္စည်းများကို သီးခြားခွဲထားခြင်း။
၇။	မီးဘေးအန္တရာယ်	• လောင်စာဆီများ သိုလှောင်ထားခြင်း။ • မီးလောင်လွယ်ပစ္စည်းများ စုပုံထားရှိခြင်း	• မီးသတ်ရေသိုလှောင်ကန်နှင့် မီးသတ်ဆေးဗူးများထားရှိရန်၊ • မီးဘေးအန္တရာယ်နှင့် ပတ်သတ်သောဆိုင်းဘုတ်များထားရှိရန်။

စဉ်	သက်ရောက်မှု	စီမံကိန်းဆောင်ရွက်ချက်	လျော့နည်းစေရန်အရေးယူ ဆောင်ရွက်မှု
၈။	လုပ်ငန်းခွင် ကျန်းမာရေးနှင့် ဘေးအန္တရာယ် ကင်းရှင်းရေး	• ဝန်ချီစက်ကဲ့သို့သော အန္တရာယ်ရှိသော လုပ်ငန်းသုံး ပစ္စည်းများကြောင့် ထိခိုက်ခြင်း။ • လုံခြုံစိတ်ချမှုမရှိသော လုပ်ငန်းခွင်ဖြစ်ပါက အန္တရာယ်ရှိနိုင်ခြင်း။ • အလုပ်သမားများ ဝင်ရောက်လာသဖြင့် လူဦးရေတိုးလာခြင်းကြောင့် အညစ်အကြေးများလာခြင်းနှင့် ကူးစက်ရောဂါများ ဖြစ်ပွားနိုင်ခြင်း။ • အမြင့်မှပြုတ်ကျပြီးအက်ရာရခြင်း။ ချော်ခြင်း၊ လဲပြိုခြင်း၊ ဓါတ်လိုက်ခြင်း	• အလုပ်သမားများအား လုပ်ငန်းခွင်သုံး အကာအကွယ်ပစ္စည်းများ (PPE) အသုံးပြုစေခြင်းနှင့် ထိုပစ္စည်းများမပါပဲ စီမံကိန်းအတွင်း ဝင်ခွင့်မပြုခြင်း။ • ရှေးဦးသူနာပြုသင်တန်းများ၊ မီးသတ်သင်တန်းများနှင့် အခြား စက်ပစ္စည်းများကိုင်တွယ်အသုံးပြုနည်း သင်တန်းများပို့ချခြင်း။ • သတိပေးဆိုင်းဘုတ်များနှင့် အရေးပေါ် ဆက်သွယ်ရန် တာဝန်ရှိသူအမည်များနှင့် ဖုန်းနံပါတ်များအား ချိတ်ဆွဲထားခြင်း။ • မတော်တဆမှုများဖြစ်ပွားပါက နီးစပ်ရာဆေးရုံ၊ ဆေးခန်းများသို့ ပို့ဆောင်ရန် အစီအစဉ်များ ရေးဆွဲထားခြင်း။ • ကျွမ်းကျင်လုပ်သားများကိုသာ လုပ်ကိုင်စေခြင်း။ • သောက်သုံးရေအလုံအလောက်ထားရှိပေးခြင်း။
၉။	လူမှုစီးပွားရေး	• ကောင်းကျိုး	• အလုပ်အကိုင်ပေါ် ပေါက်လာခြင်း။ • ဝင်ငွေတိုးပွားလာခြင်း။ • လူနေမှုအဆင့်အတန်းတိုးတက်လာခြင်း။

ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်

ဆိုးကျိုးလျော့နည်းစေသည့် အရေးယူဆောင်ရွက်မှုများနှင့်

စောင့်ကြပ်ကြည့်ရှုမည့် အစီအစဉ်

စီမံကိန်းလည်ပတ်သည့် ကာလ

၃၁

စဉ်	သက်ရောက်မှု	စီမံကိန်းဆောင်ရွက်ချက်	လျော့နည်းစေရန်အရေးယူ ဆောင်ရွက်မှု
၁၀	ဇီဝမျိုးစုံမျိုးကွဲများ အပေါ်သက်ရောက် မှု	• မြေရှင်းလင်းခြင်းအတွက် အပင်များ ခုတ်လှဲခြင်း။ • ရေထဲသို့ စက်ဆီ၊ ချောဆီများ မတော်တဆယိုဖိတ်ခြင်း။ • ဆောက်လုပ်ရေး လုပ်ငန်းများကြောင့် ဆူညံသံများဖြစ်ပေါ်ခြင်း။	• အန္တရာယ်ရှိဓာတုပစ္စည်းများဆီများချောဆီနှင့် စက်ဆီများကို ရေထဲသို့ မစွန့်ရန်။ • အလုပ်ချိန်ကို သတ်မှတ်ထားရှိခြင်း။ • အပင်များခုတ်လှဲခြင်းကို ရှောင်ရှားခြင်း။

၃၀

စဉ်	သက်ရောက်မှု	စီမံကိန်းဆောင်ရွက်ချက်	လျော့နည်းစေရန်အရေးယူဆောင်ရွက်မှု
၁။	မြင်ကွင်းပသာဒ	• အပေါ်ယံမြေဆီလွှာဖယ်ရှားခြင်း။ • သစ်ပင်များခုတ်ထွင်ရှင်းလင်းခြင်း နှင့် မြေရှင်းလင်းခြင်း၊ မြေဖို့ခြင်း။ • စက်ယန္တရားများဖြင့် ကုန်ကြမ်းများ တူးဖော်ထုတ်ယူခြင်း။ • စွန့်ပစ်မြေစာများ စုပုံခြင်း။	• မြေပြုပြင်ပြောင်းခြင်းအတွက် သစ်ပင်များ ခုတ်ထွင်ရှင်းလင်းရာတွင် တတ်နိုင်သမျှ ပတ်ဝန်းကျင်ထိခိုက်မှု လျော့နည်းအောင် စီစဉ်ဆောင်ရွက်ရန်၊ • လုပ်ကွက်ဧရိယာတွင်း ပျိုးပင်ပေါက်များ (ကြီးထွားမှုနှုန်းမြန်ပြီး ဒေသခံမျိုးရင်းပင်များ) ပျိုးထောင်ထား၍ လုပ်ကွက်ပြီးဆုံးချိန်တွင် ပြန်လည်စိုက်ပျိုးပေးခြင်း၊ • သတိပေးဆိုင်းဘုတ်များစိုက်ထူခြင်း နှင့် မြစည်းရိုးကာခြင်း၊ • သတ်မှတ်ထားသောလုပ်ကွက် ဧရိယာတွင်း ဆောင်ရွက်ခြင်း၊ • စွန့်ပစ်အမှိုက်များအား သတ်မှတ်နေရာတွင် စနစ်တကျစွန့်ပစ်ခြင်း။
၂။	လေအရည်အသွေး	• အပေါ်ယံမြေဆီလွှာဖယ်ရှားခြင်း၊ • သစ်ပင်များခုတ်ထွင်ရှင်းလင်းခြင်း နှင့် မြေရှင်းလင်းခြင်း၊ မြေဖို့ခြင်း၊ • စက်ယန္တရားများဖြင့် ကုန်ကြမ်းများ တူးဖော်ထုတ်ယူခြင်း။ • လုပ်ငန်းသုံးယာဉ်/စက်များ သွားလာခြင်း၊ • စွန့်ပစ်မြေစာများ စုပုံခြင်း။ • ကုန်တင်ကားများ၊ သင်္ဘောများမှ ပစ္စည်းများအား သယ်ယူပို့ဆောင်ရာတွင် ဖုန်မှုန့်နှင့် ဓာတ်ငွေ့များ ထွက်ခြင်း။	• ကြားခံဧရိယာအဖြစ် လုပ်ငန်းဝန်းကျင်ရှိ မြေလွတ်များတွင် သစ်ပင်စိုက်ပျိုးခြင်း၊ • အရည်အသွေးကောင်းမွန်သည့် လောင်စာဆီကို ရွေးချယ်အသုံးပြုခြင်း၊ • အရေးပေါ်မီးစက်များ၊ ယာဉ်များအား ပုံမှန် စစ်ဆေးခြင်း။ • ကောင်းမွန်သည့် ယာဉ်/စက်များကို အသုံးပြု စေခြင်း၊ • လုပ်ကွက်ဧရိယာနှင့် ကုန်ကြမ်းပစ္စည်းသယ်ယူ ပို့ဆောင်ရေး လမ်းတလျှောက် တစ်ရက်လျှင် နှစ်ကြိမ်ဖြန်းပေးခြင်း။ • မီးဖိုချောင်တွင် ကောင်းမွန်သော လေဝင် လေထွက်ရရှိအောင် ဆောင်ရွက်ခြင်း။

စဉ်	သက်ရောက်မှု	စီမံကိန်းဆောင်ရွက်ချက်	လျော့နည်းစေရန်အရေးယူဆောင်ရွက်မှု
၃။	ဆူညံသံ နှင့် တုန်ခါမှု	• တူးဖော်ရာတွင် အသုံးပြုသော စက်ယန္တရားများမှ ဆူညံသံဖြစ်ပေါ်ခြင်း • ကုန်ကြမ်းများအား သယ်ယူပို့ဆောင်ခြင်း • အရေးပေါ် မီးစက်များ လည်ပတ်ခြင်းနှင့် ပစ္စည်းများအား သယ်ယူ ပို့ဆောင်ရာတွင် အသုံးပြုသော ယာဉ်များမှ ဆူညံသံဖြစ်ပေါ်ခြင်း	• အရည်အသွေးကောင်းမွန်သည့် လောင်စာဆီကို ရွေးချယ်အသုံးပြုခြင်း • ကောင်းမွန်သည့် ယာဉ်/စက်များကို အသုံးပြု စေခြင်း။ • မီးစက်များကို အသံလုံသောအခန်းတွင် ထားရှိခြင်း။ • လုပ်ငန်းခွင် ကာကွယ်ရေးသုံးပစ္စည်းများ အသုံးပြုစေခြင်း။ • ဒေသမျိုးရင်းပင်များနှင့် အရိပ်ရပင်များ စိုက်ပျိုးခြင်း။
၄။	မြေအရည်အသွေး နှင့် ကုန်းနေဂေဟစနစ်	• သစ်ပင်များခုတ်ထွင်ရှင်းလင်းခြင်း နှင့် မြေရှင်းလင်းခြင်း၊ မြေဖို့ခြင်း၊ • ဒီဇယ်၊ ဓာတ်ဆီ သယ်ပို့ခြင်းနှင့် သိုလှောင်ခြင်း နှင့် ဖိတ်စင်ခြင်း။ • အရေးပေါ် မီးစက်များနှင့် ပစ္စည်းများအား သယ်ယူ ပို့ဆောင်ရာတွင် အသုံးပြုသော ယာဉ်များမှ ဆီများ ယိုဖိတ်ခြင်း။ • စွန့်ပစ်ပစ္စည်းများကို စနစ်တကျမစွန့်ပစ်ခြင်း။ • မိလ္လာကန်ပြည့်လျှံခြင်းမှ ယိုဖိမ့်ခြင်း။ • တူးမြောင်းကို အသုံးပြုခြင်း။	• အပေါ်ယံ မြေဆီလွှာကို စနစ်တကျဖယ်ယူခြင်း။ • လုပ်ကွက်ဧရိယာတွင်း သစ်ပင်များ ပြန်လည်စိုက်ပျိုးပေးခြင်း။ • ယာဉ်/စက်ယန္တရား များ စစ်ဆေးခြင်းနှင့် ပြုပြင်ထိန်းသိမ်းခြင်းကို စနစ်တကျ ကျွမ်းကျင်သူများ ဖြင့် ဆောင်ရွက်ခြင်း။ • ဆီသိုလှောင်ရာတွင် မတော်တဆ ဆီဖိတ်စင်မှုမှ ကာကွယ်ရန် သံကန်များ အသုံးပြုခြင်း။ • မိလ္လာကန်အား အနည်းဆုံး တစ်နှစ်တစ်ကြိမ် စုပ်ထုတ်ခြင်း။ • တူးမြောင်းကမ်းပါးများ ရေတိုက်စားမှုမရှိစေရန် ထိန်းသိမ်းရေး လုပ်ငန်းများ ဆောင်ရွက်ခြင်း။
၅။	ရေ အရည်အသွေး နှင့် ရေနေဂေဟစနစ်	• မိုးတွင်း ကာလတွင် မြေရှင်း လင်းခြင်းနှင့် မြေတူးဖော်ခြင်း၊ • မိုးတွင်းကာလတွင် စွန့်ပစ်မြေစာပုံ များမှ ရေယိုစိမ့်ခြင်း။	• ရေစီးဆင်းသောစနစ်ထားရှိပေးခြင်းနှင့် ရေမြောင်းများ တူးဖော်ပေးခြင်း။ • စွန့်ပစ်ပစ္စည်းများ ကို သတ်မှတ်ထား သော နေရာတွင် စနစ်တကျစွန့်ပစ်ခြင်း၊ • စက်ယန္တရားကို ပုံမှန်စစ်ဆေး၍ အသုံးပြုခြင်း။

စဉ်	သက်ရောက်မှု	စီမံကိန်းဆောင်ရွက်ချက်	လျော့နည်းစေရန်အရေးယူဆောင်ရွက်မှု
၅။	ရေ အရည်အသွေး နှင့် ရေနေဂေဟစနစ်	• ယာယီ စွန့်ပစ်ပစ္စည်း သိုလှောင်သည့် နေရာများမှ အညစ်အကြေးများ ယိုဖိမ့်ခြင်း။ • ပစ္စည်းများ သယ်ယူပို့ဆောင်ရာ တွင် အသုံးပြုသော ယာဉ်များမှ ဆီများယိုဖိမ့်ခြင်း။ • တူးမြောင်းကို အသုံးပြုခြင်း။	• စက်ပစ္စည်းများ တပ်ဆင်ခြင်း၊ ပြုပြင်ခြင်းများကို သတ်မှတ်နေရာတွင်ပြုလုပ်ခြင်း။ • တူးမြောင်းအတွင်းရှိ ရေနေသတ္တဝါများအတွက် ဘေးကင်းစိတ်ချရသည့် ရေအနက်နှင့် ရေစီးနှုန်း ထားရှိပေးခြင်း။ • တူးမြောင်းအတွင်း နုန်းကျရောက်မှုကို ဂရုပြု ရှင်းလင်းခြင်း။
၆။	စွန့်ပစ်ပစ္စည်း (အစိုင်အခဲ၊ အရည်)	• ရွှံ့စေးမြေနှင့် ဂဝံကျောက် တူးဖော်ရာတွင် ထွက်ရှိလာသော စွန့်ပစ်မြေစာများ၊ • မိုးတွင်းကာလတွင် စွန့်ပစ်မြေစာပုံ များမှ ရေယို့စိမ့်ခြင်း။ • စားဖိုဆောင်၊ ရုံးခန်း၊ နှင့် ဝန်ထမ်းများ နားနေဆောင်မှ ထွက်သော အမှိုက်များ။ • စားကြွင်းစားကျန်များနှင့် မီးဖိုချောင်ထွက်အမှိုက်များနှင့် ရေဆိုးများ၊ အခြားအမှိုက်များ။ • အလုပ်သမားများအသုံးပြုသော တကိုယ်ရည်သုံး စွန့်ပစ်အမှိုက်များ နှင့် သန့်စင်ခန်းမှ စွန့်ပစ်အရည်များ၊ • လုပ်ငန်းသုံးယာဉ်များနှင့် စက်များမှ အန္တရာယ်ဖြစ်စေသော အသုံးပြုပြီး စက်သုံးဆီများ နှင့်ဆီသိုလှောင်မှု အားနည်းခြင်းကြောင့် ဆီယိုဖိတ်ခြင်း။	• ရေစီးဆင်းသောစနစ်ထားရှိပေးခြင်းနှင့် ရေမြောင်းများ တူးဖော်ပေးခြင်း၊ • အမှိုက်ပုံးများထားရှိခြင်းနှင့် စနစ် တကျ စွန့်ပစ်ခြင်း၊ • စွန့်ပစ်ပစ္စည်းများကို သီးခြားခွဲထားခြင်း နှင့် ပြန်လည်အသုံးပြုနိုင်ရန် ဆောင်ရွက်ထားရှိခြင်း၊ • အိမ်သာများ တည်ဆောက်ပေးခြင်း။ • ရုံးခန်းနှင့် ဝန်ထမ်းများနားနေဆောင်တို့တွင် အမှိုက်ပုံးများထားရှိခြင်း။ • ယာဉ်များ၊ မီးစက်များမှ အသုံးပြုပြီး ဆီများအား မစွန့်ပစ်မီ ဆီစစ်သံကန်များ အသုံးပြုသိုလှောင်ခြင်း။ • စွန့်ပစ်ပစ္စည်းများအား အမှိုက်သိမ်း ဝန်ဆောင်မှုပေးသူများအား ငှားရမ်းပြီးကျိုက်မရောမြို့နယ် တော်စည်ပင်သာယာရေးအဖွဲ့၏ ညွှန်ကြားချက်များနှင့် အညီစွန့်ပစ်ခြင်း။

စဉ်	သက်ရောက်မှု	စီမံကိန်းဆောင်ရွက်ချက်	လျော့နည်းစေရန်အရေးယူဆောင်ရွက်မှု
၇။	မီးဘေးအန္တရာယ်	• လောင်စာဆီများ သိုလှောင်ထားခြင်း၊ • မီးလောင်လွယ်ပစ္စည်းများ စုပုံထားရှိခြင်း၊ • ဝါယာရှော့ဖြစ်ခြင်း။	• မီးသတ်ရေသိုလှောင်ကန်နှင့် မီးသတ်ဆေးဗူးများထားရှိရန်၊ • မီးဘေးအန္တရာယ်နှင့် ပတ်သတ်သောဆိုင်းဘုတ်များထားရှိရန်၊ • ရှော့မဖြစ်စေရန် ဝါယာကြိုးများကို ပုံမှန်စစ်ရန်နှင့် မီးလောင်လွယ် ပစ္စည်းများမစုပုံစေရန် နှစ်ပတ်တစ်ခါ လုပ်ကွက်တွင်း စစ်ဆေးရန်၊
၈။	လုပ်ငန်းခွင် ကျန်းမာရေးနှင့် ဘေးအန္တရာယ် ကင်းရှင်းရေး	• ယာဉ်များအသုံးပြုခြင်း နှင့် သွားလာခြင်းများမှ မတော်တဆထိခိုက်မှုများ၊ • အလုပ်သမားများ ခိုက်ရန်ဖြစ်ပွားမှုနှင့် အငြင်းပွားမှု၊ • ချော်လဲခြင်း၊ ပြုတ်ကျခြင်း။ • အစာအဆိပ်သင့်မှု ဖြစ်ခြင်း။ • မီးဘေး နှင့် လျှပ်စစ်ဘေးအန္တရာယ် ဖြစ်ခြင်း။	• ကျွမ်းကျင်လုပ်သားများအား ခန့်အပ်ထားခြင်း၊ • အလုပ်ချိန်အလှည့်ကျ ဆောင်ရွက်စေခြင်း၊ • သတိပေးဆိုင်းဘုတ်များတပ်ဆင်ခြင်းနှင့် လုပ်ငန်းခွင်သုံး ကာကွယ်ရေးပစ္စည်းများ အသုံးပြုစေခြင်း၊ • ကျွမ်းကျင်သော ရှေးဦးသူနာပြုများ ခန့်အပ်ခြင်း၊ အရေးပေါ်ဆေးသေတ္တာများ ထားရှိခြင်း နှင့် အရေးပေါ်ကိစ္စများအတွက် နီးစပ်ရာဆေးရုံ၊ ဆေးခန်းသို့ ပို့နိုင်ရန် စီစဉ်ထားရှိခြင်း။ • လျှောက်ကဲ့သို့သော အရေးပေါ်ကိစ္စရပ်များ ဖြစ်ပေါ်ပါက ကယ်ဆယ်မှု၊ မီးငြိမ်းသတ်မှုများ အတွက် ကြိုတင်လေ့ကျင့်မှုများ၊ အစီအစဉ်များပြုလုပ်ထားခြင်း။ • ကောင်းမွန်သော လေလည်ပတ်မှု ရရှိစေခြင်း။ • ဝါယာကြိုးများအား ပုံမှန်စစ်ဆေးပြီး လျှပ်စစ်အလွန်အကျွံသုံးစွဲခြင်း ကိုတားမြစ်ခြင်း၊

စဉ်	သက်ရောက်မှု	စီမံကိန်းဆောင်ရွက်ချက်	လျော့နည်းစေရန်အရေးယူဆောင်ရွက်မှု
၉။	လူမှုစီးပွား အခြေအနေများ	• ကောင်းကျိုး။	• အလုပ်အကိုင်အခွင့် အလမ်း ရရှိနိုင်ခြင်း၊ • ဒေသ၏လူမှုစီးပွားဖွံ့ဖြိုးတိုးတက်ခြင်း၊ • အလုပ်များ၊ ကျောင်းများ၊ လမ်းများ၊ မီးရရှိရေးများ ဖန်တီးပေးနိုင်ခြင်း၊

၃၆

eguard

ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်

ဆိုးကျိုးလျော့နည်းစေသည့် အရေးယူဆောင်ရွက်မှုများနှင့် စောင့်ကြပ်ကြည့်ရှုမည့် အစီအစဉ်

စီမံကိန်းပိတ်သိမ်းသည့်ကာလ

၃၇

စဉ်	သက်ရောက်မှု	စီမံကိန်းဆောင်ရွက်ချက်	လျော့နည်းစေရန်အရေးယူဆောင်ရွက်မှု
၁။	မြင်ကွင်းပသာဒ	• မြေဆီလွှာတူးဖော်ထုတ်လုပ်ခြင်း လုပ်ငန်းကြောင့် ကျင်းများ၊ ချိုင့်များ၊ • စွန့်ပစ်မြေစာပုံများ။	• ကျင်းများ၊ ချိုင့်များကို စွန့်ပစ်မြေစာပုံများဖြင့် စနစ်တကျပြန်ဖုံးအုပ်ခြင်း၊ • ကြီးထွားမှုနှုန်းမြန်ပြီး ဒေသခံမျိုးရင်းပင်များမှ အပင်မျိုးစေ့များနှင့် အပင်ပေါက်များကို ထိန်းသိမ်းထားပြီး လုပ်ကွက်ပြီးဆုံးသည့်ကာလတွင် ပြန်လည်စိုက်ပျိုးပေးခြင်း၊
၂။	လေအရည်အသွေး	• အဆောက်အဦးများဖျက်သိမ်းခြင်း၊ • စီမံကိန်းဖျက်သိမ်းရာတွင် အသုံးပြုသော ယာဉ်များမှ ဖုန်မှုန့်များ၊ ဓာတ်ငွေ့များ ထွက်ရှိခြင်း။ • မြေဆီလွှာပြန်လည်ဖုံးအုပ်ခြင်း။	• ဖြိုဖျက်ခြင်းကြောင့်ရရှိလာသော ဖြိုဖျက်ပစ္စည်းများကို စနစ်တကျစုပုံထားရှိခြင်း၊ • လုပ်ငန်းခွင်ကာကွယ်ရေးပစ္စည်းများအသုံးပြုစေခြင်း၊ • သတိပေးဆိုင်းဘုတ်များစိုက်ထူခြင်းနှင့် ခြံစည်းရိုးကာထားခြင်း။ • လုပ်ငန်းဖျက်သိမ်းရာတွင် ကောင်းမွန်သောယာဉ်ယန္တရားများ အသုံးပြုခြင်းနှင့်ပုံမှန်စစ်ဆေးခြင်း • ဖျက်သိမ်းထားသော ပစ္စည်းများအား မီးရှို့ခြင်းကို တားမြစ်ခြင်း။
၃။	ဆူညံသံ နှင့် တုန်ခါမှု	• စီမံကိန်းပိတ်သိမ်းရာတွင် အသုံးပြုသော ယာဉ်များ၊ စက်ပစ္စည်းများမှ ဆူညံသံနှင့် တုန်ခါမှုများ ထွက်ရှိခြင်း။ • ပိတ်သိမ်းပြီး ပစ္စည်းများအား ယာဉ်များဖြင့် သယ်ယူပို့ဆောင်ခြင်း။	• လုပ်ငန်းဖျက်သိမ်းရာတွင် အသုံးပြုသည့် ယာဉ်ယန္တရားများနှင့် စက်များအားပုံမှန်စစ်ဆေးခြင်း။ • ညအချိန်တွင် ဆူညံသံထွက်နိုင်သည့် ဖျက်သိမ်းသည့် လုပ်ငန်းများ လုပ်ဆောင်ခြင်းအား တားမြစ်ခြင်း။ • လုပ်ငန်းခွင်ကာကွယ်ရေး ပစ္စည်းများ အသုံးပြုစေခြင်း။

စဉ်	သက်ရောက်မှု	စီမံကိန်းဆောင်ရွက်ချက်	လျော့နည်းစေရန်အရေးယူ ဆောင်ရွက်မှု
၄။	မြေအရည်အသွေးနှင့် ကုန်းနေဂေဟစနစ်	• လုပ်ငန်းသုံး ယာဉ်ယန္တရားများ၊ စက်များ နှင့် ဆီသိုလှောင်သောနေရာမှ ဆီများယိုဖိတ်ခြင်း၊ • တူးဖော်ထားသည့်ကျင်းများ၊ ချိုင့်များကို စနစ်တကျ ဖုံးအုပ်ခြင်း။	• စက်ယန္တရားများကို ပုံမှန် စစ်ဆေးခြင်း။ • ဆီစစ်သံကန်များအသုံးပြုခြင်း။ • ဆီယိုဖိတ်နိုင်သော စက်ကိရိယာများအား ဂရုတစိုက် ကိုင်တွယ်အသုံးပြုခြင်း။ • လုပ်ကွက်တွင်းမြေဆီလွှာများကို စနစ်တကျပြန်လည်မြေဖို့ပေးခြင်း၊ • လုပ်ကွက်တွင်းအပင်များပြန်လည်စိုက်ပျိုးပေးခြင်း၊ • မြေဆီလွှာပြန်လည်ပြုပြင်ခြင်း၊
၅။	ရေအရည်အသွေးနှင့် ရေနေဂေဟစနစ်	• လုပ်ငန်းပိတ်သိမ်းခြင်းမှထွက်ရှိလာသော စွန့်ပစ်ပစ္စည်းများကို ရေမြောင်းများသို့စွန့်ပစ်ခြင်း၊ • လုပ်ငန်းပိတ်သိမ်းခြင်းပြုလုပ်သည့် အလုပ်သမားများမှ အသုံးပြုသည့် အိမ်သာမှ စွန့်ပစ်ရေထွက်ရှိခြင်း၊ • စက်ယန္တရားများမှဆီယိုဖိတ်ခြင်း၊	• ရေမြောင်းများအတွင်းသို့ ဖျက်သိမ်းရာမှ ထွက်လာသော အမှိုက်များအား စွန့်ပစ်ခြင်းကို တားမြစ်ခြင်း။ • ရေမြောင်းများရေစီးရေလာ ကောင်းစေရန်ဆောင်ရွက်ခြင်း။ • အိမ်သာများကိုလည်း စနစ်တကျမြေပြန်ဖို့ပြီး ဖုံးအုပ်ရန်၊ • လုပ်ငန်းသုံးယာဉ်များကို ပုံမှန်စစ်ဆေးခြင်း။

စဉ်	သက်ရောက်မှု	စီမံကိန်းဆောင်ရွက်ချက်	လျော့နည်းစေရန်အရေးယူ ဆောင်ရွက်မှု
၆။	စွန့်ပစ်ပစ္စည်း (အစိုင်အခဲနှင့် အရည်)	• စီမံကိန်းပိတ်သိမ်းရေး အလုပ်သမားများအသုံးပြုသော အိမ်သာများမှ မိလ္လာအညစ်အကြေးများထွက်ခြင်း။ • ပိတ်သိမ်းရေးလုပ်ငန်းများတွင် အသုံးပြုသော စက်ပစ္စည်းများ နှင့် ယာဉ်များမှ အသုံးပြုပြီးသောဆီများ။ • ဖျက်သိမ်းပြီးသော ပစ္စည်းများဖြစ်သည့် အမိုးများ၊ အုတ်အကျိုးအပဲ့များ ၊ သံ နှင့် မှန်ကွဲများ၊ သစ်သားအပိုင်းအစများ ကွန်ကရစ်အကျိုးအပဲ့များ။	• ပြန်လည်အသုံးပြုနိုင်သော ပစ္စည်းများအား အခြားနေရာများတွင် ပြန်လည်အသုံးပြုခြင်း။ • စီမံကိန်းပိတ်သိမ်း ရေးအလုပ်သမားများအတွက် ယာယီအိမ်သာများ ထားရှိပေးခြင်း။ • အန္တရာယ်ရှိသောစွန့်ပစ်ပစ္စည်းများ ယာယီသိုလှောင်သည့်နေရာတွင် ဆီစစ်သံကန်များအသုံးပြုခြင်း။ • အစိုင်အခဲစွန့်ပစ်ပစ္စည်းများအား အမှိုက်သိမ်း ဝန်ဆောင်မှုပေးသူများအား ဌာနမ်းပြီးကျိုက်မရောမြို့တော်စည်ပင်သာယာရေး အဖွဲ့၏ ညွှန်ကြားချက်များနှင့် အညီစွန့်ပစ်ခြင်း
၇။	မီးဘေးအန္တရာယ်	• လောင်စာဆီများ သိုလှောင်ထားခြင်း၊ • မီးလောင်လွယ်ပစ္စည်းများ စုပုံထားရှိခြင်း၊ • ဝါယာရှော့ဖြစ်ခြင်း။	• မီးသတ်ရေသိုလှောင်ကန်နှင့် မီးသတ်ဆေးဗူးများထားရှိရန်၊ • မီးဘေးအန္တရာယ်နှင့် ပတ်သတ်သောဆိုင်းဘုတ်များထားရှိရန်။ • ရှော့မဖြစ်စေရန် ဝါယာကြိုးများကို ပုံမှန်စစ်ရန်နှင့် မီးလောင်လွယ် ပစ္စည်းများမစုပုံစေရန် နှစ်ပတ်တစ်ခါ လုပ်ကွက်တွင်း စစ်ဆေးရန်။

စဉ်	သက်ရောက်မှု	စီမံကိန်းဆောင်ရွက်ချက်	လျော့နည်းစေရန်အရေးယူ ဆောင်ရွက်မှု
၈။	လုပ်ငန်းခွင် ကျန်းမာရေးနှင့် ဘေးအန္တရာယ် ကင်းရှင်းရေး	• ဝန်ချီစက်ကဲ့သို့သော အန္တရာယ်ရှိသော လုပ်ငန်းသုံး ပစ္စည်းများအတွက် ထိခိုက်ခြင်း။ • လုံခြုံစိတ်ချမှုမရှိသော လုပ်ငန်းခွင်ဖြစ်ပါက အန္တရာယ်ရှိနိုင်ခြင်း။ • လုပ်ငန်းချက်သိမ်းရာတွင် အသုံးပြုသည့် ယာဉ်ယန္တရားများ သွားလာခြင်း။ • ဂျက်သိမ်းထားသည့် ပစ္စည်းများအား သယ်ပို့ခြင်း။	• အလုပ်သမားများအား လုပ်ငန်းခွင်သုံး အကာအကွယ်ပစ္စည်းများ (PPE) အသုံးပြုခြင်းနှင့် ထိုပစ္စည်းများမပါပဲ စီမံကိန်းအတွင်း ဝင်ခွင့်မပြုခြင်း။ • ရေငုပ်သုနာပြုသင်တန်းများ၊ မီးသတ်သင်တန်းများနှင့် အခြား ဧကပ်ပစ္စည်းများ တိုင်တွယ်အသုံးပြုနည်း သင်တန်းများပို့ချခြင်း။ • သတိပေးဆိုင်းဘုတ်များနှင့် အရေးပေါ် ထက်သွယ်ရန် တာဝန်ရှိသူအမည်များနှင့် ဖုန်းနံပါတ်များအား ချိတ်ဆွဲထားခြင်း။ • ကျွမ်းကျင်လုပ်သားများကိုသာ လုပ်ကိုင်စေခြင်း။
၉။	ဇီဝမိုးစုံမိုးကွဲများ (အပင်နှင့် သတ္တဝါ)	• အန္တရာယ်ရှိ ဓာတုပစ္စည်းများကို ရေထဲသို့ မပစ်ရန် တားမြစ်ထားခြင်း	• စီမံကိန်းဒရိုယာတွင် အပင်များပြန်လည် စိုက်ပျိုးပေးခြင်း။
၁၀။	လှုပ်ခတ်မှုများရေး	• ကောင်းကျိုး	• အလုပ်အကိုင်ပေါ်ပေါက်လာခြင်း။ • ဝင်ငွေတိုးပွားလာခြင်း။ • လူနေမှုအဆင့်အတန်းတိုးတက်လာခြင်း။

ပတ်ဝန်းကျင်စောင့်ကြပ်ကြည့်ရှုမှုအစီအစဉ်

စီမံကိန်းတည်ဆောက်သည့် ကာလ

စဉ်	ပတ်ဝန်းကျင်ဆိုင်ရာ အချက်အလက်	တိုင်းတာမည့်အကြိမ်	တိုင်းတာမည့်နေရာ
၁	လေထုအရည်အသွေး	တစ်နှစ်တစ်ကြိမ်	စီမံကိန်းဇရိယာအတွင်း သင့်တော်သောနေရာ တစ်ခု
၂	ဆူညံသံ	တစ်နှစ်တစ်ကြိမ်	စီမံကိန်းဇရိယာအတွင်းနှင့် ပြင်ပ သင့်တော်သော နေရာ နှစ်ခု
၃	ရေအရည်အသွေး	တစ်နှစ်တစ်ကြိမ်	စီမံကိန်းအနီး အသုံးပြုသောအဝီစိတွင်းရေ
၄	မြေအရည်အသွေး	တစ်နှစ်တစ်ကြိမ်	စီမံကိန်းဇရိယာအတွင်း သင့်တော်သောနေရာ တစ်ခု
၅	အဓိုင်အခဲ စွန့်ပစ်ပစ္စည်း ထွက်ရှိမှု	လစဉ်	စီမံကိန်း၏ စွန့်ပစ်မြေစာပုံနေရာ

စဉ်	သက်ရောက်မှု	စီမံကိန်းဆောင်ရွက်ချက်	လျော့နည်းစေရန်အရေးယူ ဆောင်ရွက်မှု
၁၀။	သဘာဝပတ်ဝန်းကျင် ပြန်လည်ပြည်ပြင်ခြင်း	• ကောင်းကျိုး	• အဆောက်အဦများ လုပ်ငန်းသုံးယာဉ်များနှင့် စက်ယန္တရားများအား ပြန်လည်ဇယ်ရားပေးခြင်း။ • တူးဖော်ပြီးလုပ်ကွက်ထား ပြန်လည်ဖုံးအုပ်ပေးခြင်း။ • သက်ဆိုင်ရာ မြို့နယ်သစ်တောဦးစီးဌာနနှင့် ရိုက်ဆော်၍ ဒေသစိမ်းရင့်ဖြစ်သော ကြီးထွားနှုန်းအပင်များပြန်စိုက်ပျိုးရန်၊ • သက်ဆိုင်ရာဦးစီးဌာနနှင့် ဒေသစိမ်းရွှေများမှ ကျေနပ်သည့် အဆင့်အထိ သဘာဝ ပတ်ဝန်းကျင်ပြောင်းလဲမှုများအား မြေပြင်မှု များဆောင်ရွက်ပေးရန်။

ပတ်ဝန်းကျင်စောင့်ကြပ်ကြည့်ရှုမှုအစီအစဉ်

စီမံကိန်းလည်ပတ်သည့် ကာလ

စဉ်	ပတ်ဝန်းကျင်ဆိုင်ရာ အချက်အလက်	တိုင်းတာမည့်အကြိမ်	တိုင်းတာမည့်နေရာ
၁	လေထုအရည်အသွေး	တစ်နှစ်တစ်ကြိမ်	စီမံကိန်းဇရိယာအတွင်း သင့်တော်သောနေရာ တစ်ခု
၂	ဆူညံသံ	တစ်နှစ်တစ်ကြိမ်	စီမံကိန်းဇရိယာအတွင်းနှင့် ပြင်ပ သင့်တော်သော နေရာ နှစ်ခု
၃	ရေအရည်အသွေး	တစ်နှစ်တစ်ကြိမ်	စီမံကိန်းအနီး အသုံးပြုသောအဝီစိတွင်းရေ
၄	မြေအရည်အသွေး	တစ်နှစ်တစ်ကြိမ်	စီမံကိန်းဇရိယာအတွင်း သင့်တော်သောနေရာ တစ်ခု
၅	အဓိုင်အခဲ စွန့်ပစ်ပစ္စည်း ထွက်ရှိမှု	လစဉ်	စီမံကိန်း၏ စွန့်ပစ်မြေစာပုံနေရာ

ပတ်ဝန်းကျင်စောင့်ကြပ်ကြည့်ရှုမှုအစီအစဉ်

စီမံကိန်းဒိတ်သိမ်းသည့်ကာလ

စဉ်	ပတ်ဝန်းကျင်ဆိုင်ရာ အချက်အလက်	တိုင်းတာမည့်အကြိမ်	တိုင်းတာမည့်နေရာ
၁	လေထုအရည်အသွေး	တစ်ကြိမ်	စီမံကိန်းဧရိယာအတွင်း သင့်တော်သောနေရာ တစ်ခု
၂	ဆူညံသံ	တစ်ကြိမ်	စီမံကိန်းဧရိယာအတွင်းနှင့် ပြင်ပသင့်တော်သော နေရာ နှစ်ခု
၃	ရေထုအရည်အသွေး	တစ်ကြိမ်	စီမံကိန်းအနီး အသုံးပြုသောအဝီစီတွင်းရေ
၄	မြေအရည်အသွေး	တစ်ကြိမ်	စီမံကိန်းဧရိယာအတွင်း သင့်တော်သောနေရာ တစ်ခု
၅	အစိုင်အခဲ စွန့်ပစ်ပစ္စည်း ထွက်ရှိမှု	တစ်ကြိမ်	စီမံကိန်း၏ စွန့်ပစ်မြေတပုံနေရာ

အရေးပေါ်ကိစ္စများအတွက်စီမံချက်

မီးဘေးအန္တရာယ်

- မီးဘေး လုံခြုံရေးစီမံချက် (ကြိုတင်/ဖြစ်ပွားချိန်/ပြန်လည်ထူထောင်ခြင်းကာလ)ရေးဆွဲခြင်း

ကြိုတင်ကာကွယ် ရေးနည်းလမ်း	ဖြစ်ပွားချိန်အတည်ပြုပြီး ဖြေရှင်းမည့်နည်းလမ်း	ပြန်လည်ထူထောင်မည့် ကာလ
မီးသတ်ပစ္စည်း ကိရိယာများထားရှိခြင်း လုံလောက်သောမီးသတ်ရန် ရေပမာဏ၊ သဲပုံများ အသင့်ထားရှိခြင်း မြင်လွယ်ကြားလွယ်သော အချက်ပေးစနစ်များ၊ ဇလုကားများ တပ်ဆင်ခြင်း သတိပေးဆိုင်းဘုတ်များထားရှိခြင်း မီးဘေးအန္တရာယ် သင်တန်းပေးခြင်း အရေးပေါ် မီးဘေးအန္တရာယ်သရုပ်ပြ လေ့ကျင့်ပေးခြင်း	▶ အရေးပေါ်အခြေအနေအား အခြားနေရာများသို့ မပြန့်ပွားစေရန်ဆောင်ရွက်ခြင်း ▶ လူနှင့်ပစ္စည်းပျက်စီးဆုံးရှုံးမှု အနည်းဆုံးဖြစ်စေခြင်း ▶ ထိရောက်သောကယ်ဆယ်မှု နှင့် ဆေးဝါးကုသမှုပေးခြင်း ▶ ဘေးကင်းရာသို့ ပို့ ဆောင်ပေးခြင်း ▶ သက်ဆိုင်ရာ မြို့နယ်မီးသတ်ဦးစီးဌာန နှင့် ပူးပေါင်းဆောင်ရွက်ခြင်း	သက်ဆိုင်ရာတာဝန်ရှိသူများ၊ သက်ဆိုင်ရာ အဖွဲ့ အစည်းများ နှင့် ပူးပေါင်းဆောင်ရွက်ခြင်း

စောင့်ကြပ်ကြည့်ရှုရမည့်နည်းလမ်းများ

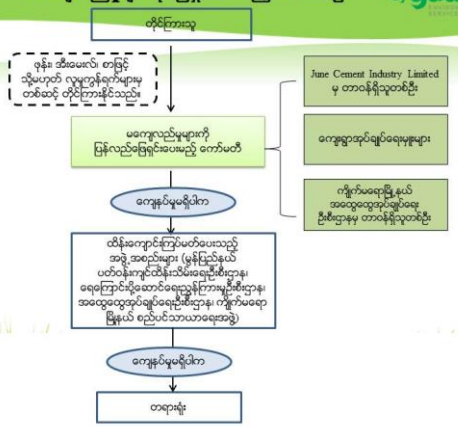
- ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေး တာဝန်ခံမှ တိုက်ရိုက်စောင့်ကြပ်ခြင်း။
- ပတ်ဝန်းကျင်ထိခိုက်မှု ရှိ၊ မရှိကို ပုံမှန်စစ်ဆေးခြင်း၊ တားမြစ်ထိန်းချုပ်ခြင်း။
- ပြည်သူလူထု၏အကြံပြုချက်များ၊ ဆွေးနွေးချက်များနှင့် ကန့်ကွက်မှုများအတွက် သတင်းများ ရယူပြီး ဖြေရှင်းဆောင်ရွက်ခြင်း။
- ပါဝင်ပတ်သက်ခြင်းမရှိသည့် ကြားနေအဖွဲ့ အစည်းမှစစ်ဆေးခြင်း။

လူမှုစီးပွားတာဝန်ယူမှု (CSR)

အသားတင်အမြတ်ငွေ၏ ၂% ကို ရန်ပုံငွေအဖြစ် ထားရှိပြီး အောက်ပါလုပ်ငန်းများတွင် အသုံးပြုရန်ရည်ရွယ်ထားသည်။

စဉ်	အကြောင်းအရာ	ရန်ပုံငွေ၏ရာခိုင်နှုန်း
၁။	ပညာရေးအတွက် အထောက်အပံ့	၄၀
၂။	ကျန်းမာရေးအတွက် အထောက်အပံ့	၃၀
၃။	လူမှုရေးအတွက် အထောက်အပံ့	၃၀

မကျေလည်မှုများကိုဖြေရှင်းပေးမည့် အစီအစဉ်



၄၉

နိဂုံး

ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်း စစ်ဆေးခြင်း - သက်ရောက်မှု / ထိခိုက်မှု အနည်းငယ် ရှိ

ရရှိနိုင်သောအကျိုးကျေးဇူးများ

- နိုင်ငံတော်အတွက် အခွန်ငွေရရှိစေခြင်း
- ဒေသဖွံ့ဖြိုးတိုးတက်စေခြင်း
- ဒေသခံပြည်သူများ အလုပ်အကိုင်ရရှိစေခြင်း

၅၀

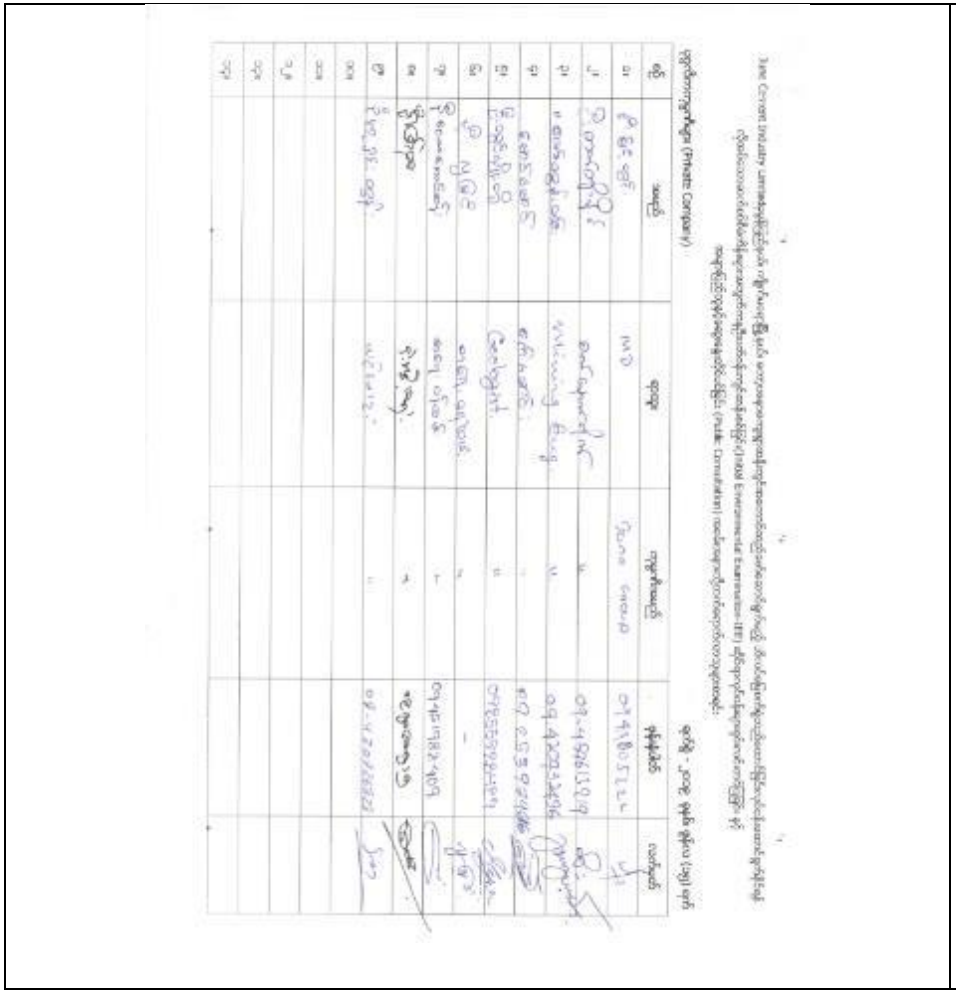
အကြံပြုချက်

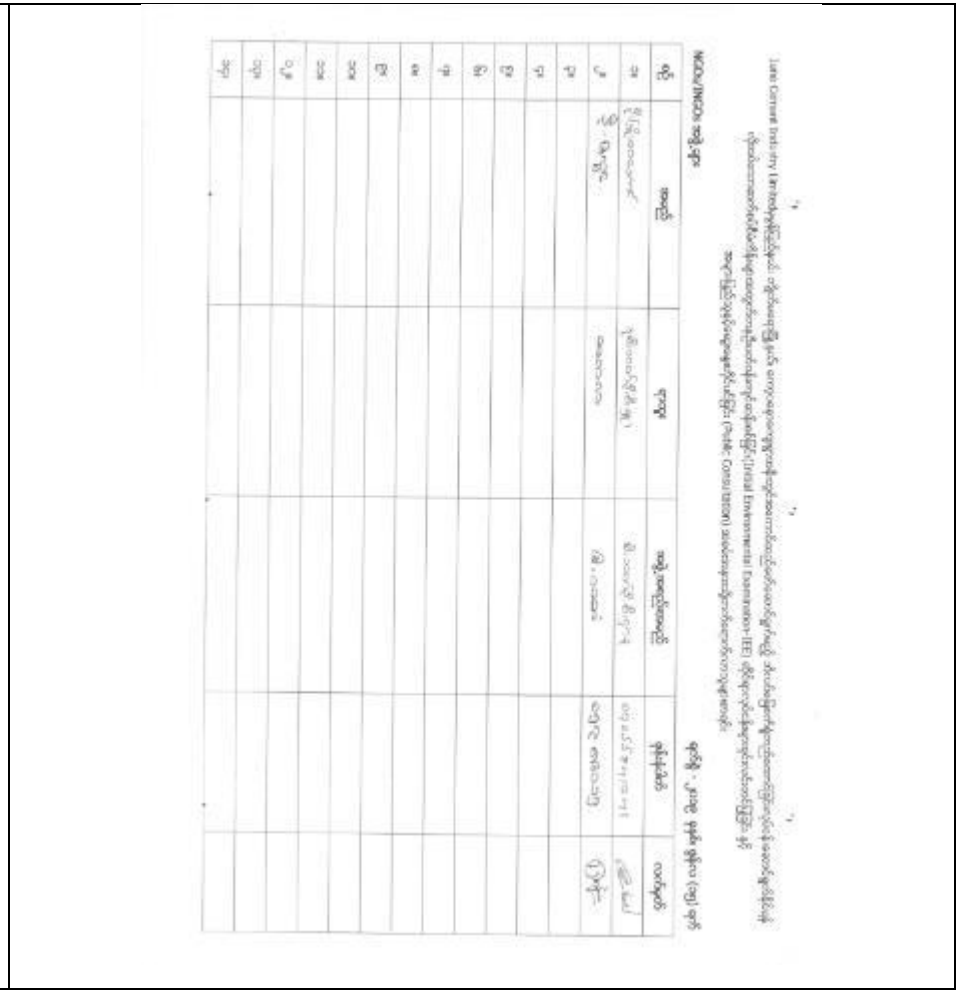
- ပတ်ဝန်းကျင်ထိခိုက်မှု အနည်းဆုံးဖြစ်စေရန်
- ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဆိုင်ရာ သိမှတ်ဖွယ်ရာများအား ဖြန့်ဝေပေးရန်
- ပတ်ဝန်းကျင်ထိန်းသိမ်းရေး လုပ်ငန်းခွင်အန္တရာယ်ကင်းရှင်းစေရေး သင်တန်းများ ပေးရန်
- လက်တွေ့ လုပ်ငန်းအတွေ့အကြုံများကိုအခြေခံ၍ပိုမိုကောင်းမွန်သောစီမံချက်များ ဆောင်ရွက်ရန်

၅၁

6/June%20Group%20Public%20Consultation%20Powerpoint

APPENDIX 5 - Public Consultation (Original Attendants' Sheets with Signatures)





June Cement Industry Limited [illegible] (Initial Environmental Examination-IEE) [illegible] (Public Consultation) [illegible]

[illegible]　　　　ရက်စွဲ - [illegible] (၁၅) ရက်

စဉ်	အမည်	မှတ်ပုံတင်	နေရပ်လိပ်စာ	အလုပ်အကိုင်	လက်မှတ်
၁	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
၂	[illegible]	[illegible]	[illegible]	NLD [illegible]	[illegible]
၃	[illegible]	[illegible]	[illegible]	[illegible]	
၄	[illegible]			[illegible]	[illegible]
၅	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] 09-44219992
၆	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
၇	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
၈	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
၉	[illegible]	[illegible]	[illegible]	[illegible] (NLD)	[illegible]
၁၀	[illegible]	[illegible]	[illegible]	[illegible] (NLD)	[illegible]
၁၁	[illegible]	[illegible]	[illegible]	[illegible] (NLD)	[illegible]
၁၂					

June Cement Industry Limited [illegible] (Initial Environmental Examination-IEE) [illegible] (Public Consultation) [illegible]

[illegible]　　　　ရက်စွဲ - [illegible] (၁၅) ရက်

စဉ်	အမည်	မှတ်ပုံတင်	နေရပ်လိပ်စာ	အလုပ်အကိုင်	လက်မှတ်
၁	[illegible]	[illegible]	[illegible] (NLD)	[illegible]	[illegible]
၂	[illegible]	[illegible]	MLM	field reporter	[illegible]
၃	[illegible]	[illegible]	MLM	Reporter	[illegible] 09-[illegible]
၄	[illegible]	[illegible]	MON	NLD [illegible]	[illegible]
၅	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] 09-7744 77864
၆					
၇					
၈					
၉					
၁၀					
၁၁					
၁၂					

June Cement Industry Ltd;

IEE's Public Consultation သို့ တက်ရောက်လာမည့်လူဦးရေစာရင်း

စဉ်	အမည်	လိပ်စာ	လက်မှတ်
၁။	[illegible]	[illegible]	[illegible]
၂။	" [illegible]	"	[illegible]
၃။	" [illegible]	[illegible]	[illegible]
၄။	" [illegible]	[illegible]	[illegible]
၅။	" [illegible]	"	[illegible]
၆။	" [illegible]	"	[illegible]
၇။	" [illegible]	[illegible]	[illegible]
၈	" [illegible]	[illegible]	[illegible]
၉			
၁၀			
၁			
၂			
၃			
၄			
၅			
၆			
၇			
၈			
၉			
၂၀			
၁			
၂			
၃			
၄			

June Cement Industry Limited [illegible] (Initial Environmental Examination-IEE) [illegible] (Public Consultation) [illegible]

စဉ်	အမည်	ဖုန်းနံပါတ်	နေရပ်လိပ်စာ	အလုပ်အကိုင်	လက်မှတ်
၁။	[illegible]	09-425355205	[illegible]	[illegible]	[illegible]
၂။	[illegible]	—	[illegible]	[illegible]	[illegible]
၃။	[illegible]	—	"	[illegible]	[illegible]
၄။	[illegible]	09-4656 74341	"	[illegible]	[illegible]
၅။	[illegible]	—	[illegible]	[illegible]	[illegible]
၆။					
၇။					
၈။					
၉။					
၁၀။					
၁၁။					
၁၂။					
၁၃။					
၁၄။					
၁၅။					

June Cement Industry Limited [illegible] (Initial Environmental Examination IEE) [illegible] (Public Consultation) [illegible]

[illegible] ရက်စွဲ - ၂၀၁၉ ခုနှစ် ဇွန်လ (၁၅) ရက်

စဉ်	အမည်	ဖုန်းနံပါတ်	နေရပ်လိပ်စာ	အလုပ်အကိုင်	လက်မှတ်
၁။	[illegible]	–	[illegible]	[illegible]	[illegible]
၂။	[illegible]	–	[illegible]	[illegible]	[illegible]
၃။	[illegible]	–	[illegible]	[illegible]	[illegible]
၄။	[illegible]	–	[illegible]	[illegible]	[illegible]
၅။	[illegible]	–	[illegible]	[illegible]	[illegible]
၆။	[illegible]	–	[illegible]	[illegible]	[illegible]
၇။	[illegible]	–	[illegible]	[illegible]	[illegible]
၈။	[illegible]	–	[illegible]	[illegible]	[illegible]
၉။	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
၁၀။	[illegible]		[illegible]	[illegible]	[illegible]
၁၁။	[illegible]		[illegible]	[illegible]	[illegible]
၁၂။	[illegible]	–	[illegible]	[illegible]	[illegible]
၁၃။	[illegible]	–	[illegible]	[illegible]	[illegible]
၁၄။	[illegible]	–	[illegible]	[illegible]	[illegible]

June Cement Industry Limited [illegible] (Initial Environmental Examination-IEE) [illegible] (Public Consultation) [illegible]

[illegible] ရက်စွဲ - ၂၀၁၉ ခုနှစ် ဇွန်လ (၁၅) ရက်

စဉ်	အမည်	ဖုန်းနံပါတ်	နေရပ်လိပ်စာ	အလုပ်အကိုင်	လက်မှတ်
၁။	[illegible]	–	[illegible]	[illegible]	
၂။	[illegible]	09 692370846	[illegible]	[illegible]	[illegible]
၃။	[illegible]	09 961943540		[illegible]	[illegible]
၄။	[illegible]	09 [illegible]	[illegible]	[illegible]	[illegible]
၅။	[illegible]	09 7991902959	[illegible]	[illegible]	[illegible]
၆။	[illegible]		[illegible]	[illegible]	[illegible]
၇။	[illegible]		[illegible]	[illegible]	[illegible]
၈။	[illegible]		[illegible]	[illegible]	[illegible]
၉။	[illegible]		[illegible]	[illegible]	[illegible]
၁၀။	[illegible]		[illegible]	[illegible]	[illegible]
၁၁။	[illegible]		[illegible]	[illegible]	[illegible]
၁၂။	[illegible]		[illegible]	[illegible]	[illegible]
၁၃။	[illegible]		[illegible]	[illegible]	[illegible]
၁၄။	[illegible]	09-[illegible]0449831	[illegible]	[illegible]	[illegible]

June Cement Industry Limited [illegible] (Initial Environmental Examination-IEE) [illegible]
[illegible] (Public Consultation) [illegible]

ရပ်မိရပ်ဖဒေသခံပြည်သူများ

ရက်စွဲ - ၂၀၁၉ ခုနှစ် ဇွန်လ (၁၅) ရက်

စဉ်	အမည်	မှတ်ပုံတင်	နေရပ်လိပ်စာ	အလုပ်အကိုင်	လက်မှတ်
၁။	[illegible]	—	[illegible]	[illegible]	[illegible]
၂။	[illegible]	—	"	[illegible]	X
၃။	[illegible]	—	"	[illegible]	X
၄။	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
၅။	[illegible]	[illegible]	"	[illegible]	[illegible]
၆။					
၇။					
၈။					
၉။					
၁၀။					
၁၁။					
၁၂။					
၁၃။					
၁၄။					

June Cement Industry Limited [illegible] (Initial Environmental Examination-IEE) [illegible]
[illegible] (Public Consultation) [illegible]

ရပ်မိရပ်ဖဒေသခံပြည်သူများ

ရက်စွဲ - ၂၀၁၉ ခုနှစ် ဇွန်လ (၁၅) ရက်

စဉ်	အမည်	မှတ်ပုံတင်	နေရပ်လိပ်စာ	အလုပ်အကိုင်	လက်မှတ်
၁။	[illegible]	—	[illegible]	[illegible]	[illegible]
၂။	[illegible]	—	[illegible]	"	—
၃။	[illegible]	—	[illegible]	"	[illegible]
၄။	[illegible]	—	"	[illegible]	[illegible]
၅။	[illegible]	—	"	[illegible]	[illegible]
၆။	[illegible]	—	[illegible]	[illegible]	[illegible]
၇။					
၈။					
၉။					
၁၀။					
၁၁။					
၁၂။					
၁၃။					
၁၄။					

June Cement Industry Limited [illegible] (Initial Environmental Examination-IEE) [illegible]
[illegible] (Public Consultation) [illegible]

ရပ်မိရပ်ဖဒေသခံပြည်သူများ

ရက်စွဲ - ၂၀၁၉ ခုနှစ်၊ ဇွန်လ (၁၅) ရက်

စဉ်	အမည်	ဖုန်းနံပါတ်	နေရပ်လိပ်စာ	အလုပ်အကိုင်	လက်မှတ်
၁။	[illegible]	–	[illegible]	[illegible]	[illegible]
၂။	[illegible]	–	။	[illegible]	[illegible]
၃။	[illegible]	–	[illegible]	[illegible]	[illegible]
၄။	[illegible]	–	[illegible]	[illegible]	[illegible]
၅။	[illegible]	–	[illegible]	[illegible]	[illegible]
၆။	[illegible]	–	။	[illegible]	[illegible]
၇။	[illegible]	–	။	[illegible]	[illegible]
၈။	[illegible]	–	။	[illegible]	[illegible]
၉။	[illegible]	–	[illegible]	[illegible]	[illegible]
၁၀။	[illegible]	–	[illegible]	[illegible]	[illegible]
၁၁။	[illegible]	09-796024877	[illegible]	[illegible]	[illegible]
၁၂။	[illegible]	09 78114 3673	[illegible]	[illegible]	[illegible]
၁၃။	[illegible]	09 425265861	[illegible]	[illegible]	[illegible]
၁၄။	[illegible]	–	[illegible]	[illegible]	[illegible]

June Cement Industry Limited [illegible] (Initial Environmental Examination-IEE) [illegible]
[illegible] (Public Consultation) [illegible]

ရပ်မိရပ်ဖဒေသခံပြည်သူများ

ရက်စွဲ - ၂၀၁၉ ခုနှစ်၊ ဇွန်လ (၁၅) ရက်

စဉ်	အမည်	ဖုန်းနံပါတ်	နေရပ်လိပ်စာ	အလုပ်အကိုင်	လက်မှတ်
၁။	[illegible]	01-8550	[illegible]	[illegible]	[illegible]
၂။	[illegible]	09-405354469	[illegible]	[illegible]	[illegible]
၃။	[illegible]		[illegible]	[illegible]	[illegible]
၄။	[illegible]	09-259 56299	[illegible]	[illegible]	[illegible]
၅။	[illegible]		[illegible]	[illegible]	[illegible]
၆။	[illegible]	09 [illegible] 262547	[illegible]	[illegible]	[illegible]
၇။	[illegible]		[illegible]	[illegible]	[illegible]
၈။	[illegible]		[illegible]	[illegible]	[illegible]
၉။	[illegible]		[illegible]	[illegible]	[illegible]
၁၀။	[illegible]		[illegible]	[illegible]	[illegible]
၁၁။	[illegible]		[illegible]	[illegible]	[illegible]
၁၂။	[illegible]		[illegible]	[illegible]	[illegible]
၁၃။	[illegible]		[illegible]	[illegible]	[illegible]
၁၄။	[illegible]		[illegible]	[illegible]	[illegible]

June Cement Industry Limited ... (Initial Environmental Examination-IEE) ... (Public Consultation) ...

ရပ်မိရပ်ဖ၊ ဒေသခံပြည်သူများ

ရက်စွဲ - ၂၀၁၉ ခုနှစ် ဇွန်လ (၁၅) ရက်

စဉ်	အမည်	ဖုန်းနံပါတ်	နေရပ်လိပ်စာ	အလုပ်အကိုင်	လက်မှတ်
၁။	[illegible]		[illegible]	[illegible]	[illegible]
၂။	[illegible]		"	[illegible]	[illegible]
၃။	[illegible]		[illegible]	[illegible]	[illegible]
၄။	[illegible]		[illegible]	[illegible]	[illegible]
၅။	[illegible]		"	[illegible]	[illegible]
၆။	[illegible]		[illegible]	[illegible]	[illegible]
၇။	[illegible]		[illegible]	[illegible]	[illegible]
၈။	[illegible]		[illegible]	[illegible]	[illegible]
၉။	[illegible]		[illegible]	[illegible]	[illegible]
၁၀။	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
၁၁။	[illegible]		[illegible]	[illegible]	[illegible]
၁၂။					
၁၃။					
၁၄။					

June Cement Industry Limited ... (Initial Environmental Examination-IEE) ... (Public Consultation) ...

ရပ်မိရပ်ဖ၊ ဒေသခံပြည်သူများ

ရက်စွဲ - ၂၀၁၉ ခုနှစ် ဇွန်လ (၁၅) ရက်

စဉ်	အမည်	ဖုန်းနံပါတ်	နေရပ်လိပ်စာ	အလုပ်အကိုင်	လက်မှတ်
၁။	[illegible]	—	[illegible]	[illegible]	[illegible]
၂။	[illegible]	—	[illegible]	[illegible]	X
၃။	[illegible]	—	[illegible]	[illegible]	[illegible]
၄။	[illegible]	09771196912	[illegible]	[illegible]	[illegible]
၅။	[illegible]		[illegible]	[illegible]	[illegible]
၆။	[illegible]		[illegible]	[illegible]	[illegible]
၇။	[illegible]		"	[illegible]	[illegible]
၈။	[illegible]	09782235272	"	[illegible]	[illegible]
၉။	[illegible]	—	[illegible]	[illegible]	[illegible]
၁၀။	[illegible]	—	[illegible]	[illegible]	[illegible]
၁၁။	[illegible]	—	"	[illegible]	[illegible]
၁၂။	[illegible]	—	"	[illegible]	[illegible]
၁၃။	[illegible]	—	[illegible]	[illegible]	[illegible]
၁၄။	[illegible]	—	[illegible]	—	[illegible]

APPENDIX 6 - Company Registration

ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ 009630

အမျိုးသားစီမံကိန်းနှင့် စီးပွားရေးဖွံ့ဖြိုးတိုးတက်မှုဝန်ကြီးဌာန

ကုမ္ပဏီမှတ်ပုံတင်လက်မှတ် သက်တမ်းတိုး

အမှတ် ...၉.../ ၂၀၁၃ - ၂၀၁၄

မြန်မာနိုင်ငံ ကုမ္ပဏီများ အက်ဥပဒေအရ ဒဂုန် ဘိလပ်မြေ စက်မှုလက်မှုနှင့် ထုတ်လုပ်မှု လီမိတက် ..... အား ပေးရန်တာဝန် ကန့်သတ်ထားသော လီမိတက် ကုမ္ပဏီအဖြစ် ၂၀၁၁ ခုနှစ်၊ ဧပြီ လ၊ ၁ ရက်နေ့တွင် မှတ်ပုံတင်ထားခြင်းအား ၂၀၁၃ ခုနှစ်၊ နိုဝင်ဘာ လ၊ ၂၉ ရက်နေ့မှစ၍ သက်တမ်းတိုး ခွင့်ပြုလိုက်သည်။

ညွှန်ကြားရေးမှူးချုပ် (ကိုယ်စား)
(နန်းဇီရီသန်း ၊ ညွှန်ကြားရေးမှူး)
ရင်းနှီးမြှုပ်နှံမှုနှင့်ကုမ္ပဏီများညွှန်ကြားမှုဦးစီးဌာန

THE GOVERNMENT OF THE REPUBLIC OF THE UNION OF MYANMAR
MINISTRY OF NATIONAL PLANNING AND ECONOMIC DEVELOPMENT

CERTIFICATE OF INCORPORATION

NO. 9 of 2011 - 2012

I hereby certify that the tenure of JUNE CEMENT INDUSTRY LIMITED incorporated under the Myanmar Companies Act on 1st APRIL, 2011 is renewed with effected from 29th NOVEMBER, 2013

For Director General
(Nang Yi Yi Than, Director)
Directorate of Investment and Company Administration

APPENDIX 7 - Using farmland by other means permit

၁၁၂

ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်

ပြည်နယ်အစိုးရအဖွဲ့

မွန်ပြည်နယ်

စာအမှတ်၊ ၃၀၀ / ၁ - ၁၀ / ၀၁၇ (မွန်)

ရက်စွဲ ၊ ၂၀၁၆ ခုနှစ်၊ ဖေဖော်ဝါရီလ ၈ ရက်

သို့

အတွင်းရေးမှူး

ပြည်နယ်လယ်ယာမြေစီမံခန့်ခွဲမှုအဖွဲ့

(လယ်ယာမြေစီမံခန့်ခွဲရေး နှင့် စာရင်းအင်းဦးစီးဌာန) ၊ မွန်ပြည်နယ်

အကြောင်းအရာ။ **လယ်မြေအားအခြားနည်းအသုံးပြုခွင့် တင်ပြလာခြင်းကိစ္စ**

ရည် ညွှန်း ချက်။ အတွင်းရေးမှူး၊ ပြည်နယ်လယ်ယာမြေစီမံခန့်ခွဲမှုအဖွဲ့ (လယ်ယာမြေစီမံခန့်ခွဲရေးနှင့် စာရင်းအင်းဦးစီးဌာန)မွန်ပြည်နယ်၏ (၂၇-၁-၂၀၁၆)ရက်စွဲပါ စာအမှတ်၊ ၂၂/၁၈/ လယဖ/၂၀၁၆

မွန်ပြည်နယ် ၊ ကျိုက်မရောမြို့နယ် ၊ ကော့ပနော့ကျေးရွာအုပ်စု နှင့် မယ်ကရိုကျေးရွာ ၊ ကွင်းအမှတ် (၄၀၆ + ၄၀၇-က + ၄၀၈) ၊ ဦးပိုင်ပေါင်း (၁၇၂)ခု ၊ **မြေဧရိယာ (၇၁၃.၅၇) ဧကရှိ** လယ်မြေအား ဒေါက်တာနုနုဝင်း ၊ ၁၀/မလမ (နိုင်) ၁၄၃၂၄၀ ၊ (ကုမ္ပဏီ ၊ မန်နေးဂျင်းဒါရိုက်တာ) အမှတ်(၈၀)၊ ဆရာစံလမ်းသွယ် ၊ ဗဟန်းမြို့နယ် ၊ ရန်ကုန်တိုင်းဒေသကြီးတွင် နေထိုင်သူမှ **ဘိလပ်မြေစက်ရုံဆောက်လုပ်ရန်မြေအဖြစ်** အသုံးပြုခွင့်ရရှိရေးအတွက် အမှုတွဲဖွင့်လှစ် တည်ဆောက်၍ မြို့နယ်/ ခရိုင်/ ပြည်နယ်လယ်ယာမြေစီမံခန့်ခွဲမှုအဖွဲ့အဆင့်ဆင့် အစည်းအဝေး ဆုံးဖြတ်ချက်သဘောထား တို့နှင့်အတူ လယ်မြေအားအခြားနည်းအသုံးပြုခွင့် လယ်ယာမြေ ဥပဒေပုဒ်မ ၃၀(က) ရရှိရေးအတွက် ရည်ညွှန်းချက်ပါစာဖြင့် တင်ပြလာခြင်းနှင့် စပ်လျဉ်း၍ **(၄ -၂-၂၀၁၆) ရက်နေ့ မွန်ပြည်နယ်အစိုးရအဖွဲ့ အစည်းအဝေး (၄ / ၂၀၁၆)** ၊ဆုံးဖြတ်ချက် အပိုဒ်(၆၉)အရ **လုပ်ထုံးလုပ်နည်းနှင့်အညီ တင်ပြဆောင်ရွက်သွားရန်** အကြောင်းကြားပါသည်။

ပူးတွဲ ။ အမှုတွဲအမှတ် ၊ ၅ /၂၀၁၅-၂၀၁၆

ဝန်ကြီးချုပ်(ကိုယ်စား)

(ဇော်လင်းထွန်း ၊ အတွင်းရေးမှူး)

မိတ္တူကို

ဝန်ကြီး ၊ စိုက်ပျိုးရေး နှင့် မွေးမြူရေးဝန်ကြီးဌာန ၊ မွန်ပြည်နယ်

အုပ်ချုပ်ရေးမှူး ၊ မြို့နယ်အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာန၊ ကျိုက်မရောမြို့

ဒေါက်တာနုနုဝင်း ၊ (ကုမ္ပဏီ ၊ မန်နေးဂျင်းဒါရိုက်တာ)အမှတ်(၈၀)၊ ဆရာစံလမ်းသွယ် ၊ ဗဟန်းမြို့နယ် ၊ ရန်ကုန်တိုင်းဒေသကြီး

ရုံးလက်ခံစာတွဲ / မျှောစာတွဲ။

AAAA-4 251

ပုံစံ - ၁၅

ဗဟိုလယ်ယာမြေစီမံခန့်ခွဲမှုအဖွဲ့
လယ်မြေအား အခြားနည်းဖြင့်အသုံးပြုရန် ခွင့်ပြုမိန့်

မွန် တိုင်းဒေသကြီး/ ပြည်နယ်၊ မော်လမြိုင် ခရိုင်၊ ကျိုက်မရော မြို့နယ်၊ (မယ်ကရို၊ ကောဉပနော) ရပ်ကွက်/ ကျေးရွာအုပ်စုနေ ဦး မင်းသိန်း ၏ သား/ သမီး ဦး/ ဒေါ်/ အဖွဲ့အစည်း နုနဉ်း နိုင်ငံသား/ အမျိုးသားစိစစ်ရေးကတ်အမှတ် ၁၀/ မလမ (နိုင်) ၁၄၃၂၄၀ အား လယ်ယာမြေ ဥပဒေပုဒ်မ ၂၉ နှင့် ၃၀ တို့အရ အောက်ဖော်ပြပါ လယ်မြေကို သတ်မှတ်ထားသည့် စည်းကမ်းချက် များနှင့်အညီ အခြားနည်းဖြင့် အသုံးပြုခွင့်ပြုလိုက်သည်။

အခြားနည်းအသုံးပြုခွင့်ပြုသည့် လယ်မြေအကြောင်းအရာ
မွန် တိုင်းဒေသကြီး/ပြည်နယ်၊ မော်လမြိုင် ခရိုင်၊ ကျိုက်မရော မြို့နယ်

စဉ်	ရပ်ကွက်/ ကျေးရွာ အုပ်စု	ကွင်း/ အကွက် အမှတ်နှင့် အမည်	ဦးပိုင် အမှတ်	မြေမျိုး	ခွင့်ပြုသည့် ဧရိယာ		ခွင့်ပြုသည့် နည်းလမ်း	မှတ် ချက်
					ဧက	ဒသမ		
၁	၂	၃	၄	၅	၆	၇	၈	၉
	မယ်ကရို၊ ကောဉပနော	(၄၀၆၊ ၄၀၇-က၊ ၄၀၈)၊ ကောလစ်၊ မယ်ကရိုအရှေ့၊ ပျားဆောင် မြောက်ကွင်း	ဦးပိုင်ပေါင်း (၁၇၂) ခု	လယ်	၇၁၃	၅၇	ဘိလပ်မြေစက်ရုံ လုပ်ငန်းသုံး မြေနေရာ	
					၇၁၃	၅၇		

သက်သေခံမြေပုံပူးတွဲထားပါသည်။

ဗဟိုလယ်ယာမြေစီမံခန့်ခွဲမှုအဖွဲ့၏ (၁၉-၁၀-၂၀၁၆) ရက်နေ့ အစည်းအဝေးအမှတ်စဉ် (၃/ ၂၀၁၆) ဆုံးဖြတ်ချက်အမှတ် ၁(စျ) အရ လက်မှတ်ရေးထိုးထုတ်ပေးခြင်းဖြစ်သည်။

ရုံးတံဆိပ်

(----------)
အတွင်းရေးမှူး
ဗဟိုလယ်ယာမြေစီမံခန့်ခွဲမှုအဖွဲ့
နေပြည်တော်

စာအမှတ်၊ ၁၅/ လယ-၃၀ (၀၀၁ /၂၀၁၆)
ရက်စွဲ၊ ၂၀၁၆ ခုနှစ်၊ နိုဝင်ဘာလ (၂၉)ရက်

APPENDIX 8 – Plot numbers for Clay soil production

၉၅

သို့

မြို့နယ်မြေစာရင်းဦးစီးဌာနမှူး

မြို့နယ်မြေစာရင်းဦးစီးဌာန

ကျိုက်မရောမြို့။

ရက်စွဲ၊ ၂၀၁၅ ခုနှစ်၊ ဖေဖော်ဝါရီလ (၈) ရက်

၁။ လျှောက်ထားသူအမည် - ဒေါက်တာနုနုဝင်း
၂။ အဘအမည် - ဒေါက်တာမင်းသိမ်း
၃။ နိုင်ငံသားစီစစ်ရေးကတ်အမှတ် - ၁၀/မလမ (နိုင်) ၁၄၃၂၄၀
၄။ အလုပ်အကိုင် - မန်နေဂျင်းဒါရိုက်တာ
၅။ အမြဲနေထိုင်သည့်နေရပ်လိပ်စာ - အမှတ် (၈၀)၊ ဆရာစံလမ်းသွယ်၊ ဆရာစံမြောက်/
အနောက်ရပ်ကွက်၊ ဗဟန်းမြို့နယ်၊ ရန်ကုန်တိုင်းဒေသကြီး။

၆။ **လျှောက်ထားသည့်မြေ၏ အကြောင်းအရာ**

စဉ်	ကျေးရွာအုပ်စု/ ကျေးရွာ	ကွင်း/အကွက် အမှတ် နှင့်အမည်	ဦးပိုင်	မြေမျိုး/ အတန်း	ဧရိယာ ဧက	မှတ်ချက်
၁	မယ်ကရိ	၄၀၆/ကော့လစ်ပ်	၁	လယ်	၂.၃၆	
၂	မယ်ကရိ	၄၀၆/ကော့လစ်ပ်	၄/၁+၂	လယ်	၆.၁၄	
	မယ်ကရိ	၄၀၆/ကော့လစ်ပ်	၅/၁ က	လယ်	၄.၀၀	
၄	မယ်ကရိ	၄၀၆/ကော့လစ်ပ်	၅/၁ ခ	လယ်	၂.၀၃	
၅	မယ်ကရိ	၄၀၆/ကော့လစ်ပ်	၅/၂	လယ်	၃.၈၄	
၆	မယ်ကရိ	၄၀၆/ကော့လစ်ပ်	၅ / ၃+၉	လယ်	၆.၈၆	
၇	မယ်ကရိ	၄၀၆/ကော့လစ်ပ်	၆	လယ်	၄.၂၇	
၈	မယ်ကရိ	၄၀၆/ကော့လစ်ပ်	၇	လယ်	၈.၉၆	
၉	မယ်ကရိ	၄၀၆/ကော့လစ်ပ်	၈	လယ်	၄.၈၆	
၁၀	မယ်ကရိ	၄၀၆/ကော့လစ်ပ်	၁၁	လယ်	၁၁.၃၈	
၁၁	မယ်ကရိ	၄၀၆/ကော့လစ်ပ်	၁၂	လယ်	၂.၁၉	
၁၂	မယ်ကရိ	၄၀၆/ကော့လစ်ပ်	၁၃	လယ်	၃.၃၁	
၁၃	မယ်ကရိ	၄၀၆/ကော့လစ်ပ်	၁၄	လယ်	၄၈.၁၀	
၁၄	မယ်ကရိ	၄၀၆/ကော့လစ်ပ်	၁၅	လယ်	၁၁.၀၆	
၁၅	မယ်ကရိ	၄၀၆/ကော့လစ်ပ်	၂၂/၂	လယ်	၂.၀၀	
၁၆	မယ်ကရိ	၄၀၆/ကော့လစ်ပ်	၂၂/၃	လယ်	၃.၀၀	

- ၂ -

စဉ်	ကျေးရွာအုပ်စု/ကျေးရွာ	ကွင်း/အကွက် အမှတ် နှင့်အမည်	ဦးပိုင်	မြေမျိုး/အတန်း	ရေိယာ ဧက	မှတ်ချက်
၁၇	မယ်ကရိ	၄၀၆/ကော့လစပ်	၂၃	လယ်	၄. ၂၉	
၁၈	မယ်ကရိ	၄၀၆/ကော့လစပ်	၂၄	လယ်	၄. ၉၁	
၁၉	မယ်ကရိ	၄၀၆/ကော့လစပ်	၂၆	လယ်	၄. ၀၀	
၂၀	မယ်ကရိ	၄၀၆/ကော့လစပ်	၂၈/၁	လယ်	၂. ၀၀	
၂၁	မယ်ကရိ	၄၀၆/ကော့လစပ်	၃၅/၁	လယ်	၁. ၈၀	
၂၂	မယ်ကရိ	၄၀၆/ကော့လစပ်	၄၄/၁	လယ်	၄. ၀၀	
၂၃	မယ်ကရိ	၄၀၆/ကော့လစပ်	၅၆	လယ်	၃. ၄၈	
၂၄	မယ်ကရိ	၄၀၆/ကော့လစပ်	၅၇	လယ်	၃. ၀၃	
၂၅	မယ်ကရိ	၄၀၆/ကော့လစပ်	၅၉	လယ်	၁. ၄၉	
၂၆	မယ်ကရိ	၄၀၆/ကော့လစပ်	N 2	လယ်	၁. ၅၀	
၂၇	မယ်ကရိ	၄၀၆/ကော့လစပ်	N 65	လယ်	၂. ၄၅	
၂၈	မယ်ကရိ	၄၀၆/ကော့လစပ်	N 68	လယ်	၄. ၀၀	
၂၉	မယ်ကရိ	၄၀၆/ကော့လစပ်	N 79	လယ်	၁. ၀၀	
၃၀	မယ်ကရိ	၄၀၆/ကော့လစပ်	N 82	လယ်	၁. ၀၀	
၃၁	မယ်ကရိ	၄၀၆/ကော့လစပ်	N 6	လယ်	၅. ၀၀	
					၁၆၈. ၃၁	

စဉ်	ကျေးရွာအုပ်စု/ကျေးရွာ	ကွင်း/အကွက် အမှတ် နှင့်အမည်	ဧရိယာ	မြေမျိုး/အတန်း	ရေယာကေ	မှတ်ချက်
၁	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၁/၁	လယ်	၃. ၃၄	
၂	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၁/၂	လယ်	၃. ၉၀	
၃	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၂/၁	လယ်	၆. ၀၀	
၄	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၃	လယ်	၄. ၀၀	
၅	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၄	လယ်	၃. ၀၀	
၆	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၅/၁	လယ်	၅. ၃၂	
၇	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၅/၁က	လယ်	၁. ၀၀	
၈	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၅/၂	လယ်	၈. ၁၄	
၉	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၅/၃	လယ်	၆. ၃၇	
၁၀	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၆/၁	လယ်	၄. ၀၀	
၁၁	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၆/၂	လယ်	၅. ၀၀	
၁၂	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၇/၂	လယ်	၂. ၀၀	
၁၃	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၈	လယ်	၅. ၀၀	
၁၄	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၉/၁	လယ်	၄. ၂၂	
၁၅	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၉/၂က	လယ်	၂. ၅၃	
၁၆	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၉/၂ခ	လယ်	၂. ၅၃	
၁၇	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၉/၃	လယ်	၅. ၂၁	
၁၈	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၁၀	လယ်	၅. ၆၇	
၁၉	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၁၁/၁	လယ်	၃. ၃၉	
၂၀	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၁၁/၂	လယ်	၃. ၃၉	
၂၁	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၁၂	လယ်	၄. ၃၉	
၂၂	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၁၃က	လယ်	၃. ၁၂	
၂၃	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၁၃ ခ	လယ်	၃. ၄၇	
၂၄	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၁၃ဃ	လယ်	၄. ၀၀	
၂၅	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၁၃ င	လယ်	၂. ၅၇	
၂၆	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၁၃ ဆ	လယ်	၂. ၅၀	
၂၇	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၁၃ စ	လယ်	၄. ၀၀	
၂၈	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၁၅/၁	လယ်	၃. ၃၃	
၂၉	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၁၆/၁က	လယ်	၄. ၀၀	
၃၀	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၁၆/၁ခ	လယ်	၆. ၂၁	

စဉ်	ကျေးရွာအုပ်စု/ကျေးရွာ	ကွင်း/အကွက် အမှတ် နှင့်အမည်	ဦးပိုင်	မြေမျိုး/အကန်း	ဧရိယာ ဧက	မှတ်ချက်
၃၁	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၁၆/၂	လယ်	၂. ၃၀	
၃၂	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၁၆/၂ခ	လယ်	၃. ၂၀	
၃၃	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၁၇/၁	လယ်	၁. ၉၀	
၃၄	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၁၇/၂	လယ်	၈. ၆၇	
၃၅	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၁၇/၃	လယ်	၃. ၈၀	
၃၆	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၁၇/၄	လယ်	၄. ၃၂	
၃၇	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၁၈/၁	လယ်	၂. ၆၄	
၃၈	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၁၈/၂	လယ်	၂. ၅၈	
၃၉	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၁၉/၁	လယ်	၂. ၀၆	
၄၀	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၁၉/၁	လယ်	၃. ၀၄	
၄၁	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၁၉/၂	လယ်	၃. ၀၄	
၄၂	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၁၉/၃	လယ်	၃. ၀၄	
၄၃	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၂၀	လယ်	၃. ၆၃	
၄၅	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၂၁/၁	လယ်	၄. ၀၃	
၄၆	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၂၁/၂	လယ်	၃. ၇၈	
၄၇	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၂၂/၁	လယ်	၂. ၀၀	
၄၈	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၂၂/၂	လယ်	၂. ၀၀	
၄၉	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၂၂/၃	လယ်	၂. ၀၂	
၅၀	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၂၃	လယ်	၃. ၄၀	
၅၁	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၂၅/၁	လယ်	၄. ၉၈	
၅၂	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၂၈	လယ်	၃. ၄၃	
၅၃	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၂၉/၂	လယ်	၄. ၀၀	
၅၄	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၃၀	လယ်	၁၀. ၀၀	
၅၅	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၃၅	လယ်	၄. ၉၄	
၅၆	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၃၆/၁	လယ်	၄. ၀၄	
၅၇	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၃၆/၂	လယ်	၃. ၃၃	
၅၈	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၃၇/က	လယ်	၂. ၀၆	
၅၉	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၃၇ခ/၁	လယ်	၂. ၈၃	
၆၀	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၃၇ခ/၂	လယ်	၂. ၅၀	

စဉ်	ကျေးရွာအုပ်စု/ ကျေးရွာ	ကွင်း/အကွက် အမှတ် နှင့်အမည်	ဦးပိုင်	မြေဧရိယာ/ အတန်း	ဧရိယာ ဧက	မှတ်ချက်
၆၁	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၃၇၁/၃	လယ်	၂. ၀၀	
၆၂	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	၃၈	လယ်	၄. ၀၀	
၆၃	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	N ၁	လယ်	၁. ၈၄	
၆၄	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	N ၃	လယ်	၄. ၀၈	
၆၅	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	N ၅	လယ်	၁. ၆၈	
၆၆	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	N ၇	လယ်	၁. ၅၀	
၆၇	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	N ၈	လယ်	၄. ၃၀	
၆၈	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	N ၁၀	လယ်	၃. ၀၀	
၆၉	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	N ၁၁	လယ်	၂. ၀၀	
၇၀	မယ်ကရိ	၄၀၇ က/မယ်ကရိအရှေ့	N ၁၄	လယ်	၀. ၃၄	
					၂၆၂. ၃၂	

APPENDIX 9 - Corporate Social Responsibility

JUNE CEMENT INDUSTRY LTD.

အခြေခံပညာမူလတန်းကျောင်း ၊ မယ်ကရိုကျေးရွာ

ကျိုက်မရောမြို့နယ် ၊ မွန်ပြည်နယ်

မှတ်တမ်းတင်ဂုဏ်ပြုလွှာ

ကျိုက်မရောမြို့နယ်၊ မယ်ကရိုကျေးရွာ အခြေခံပညာမူလတန်းကျောင်းရှိ ကျောင်းသား/ ကျောင်းသူများ၏ ဘက်စုံပညာရည်ဖွံ့ဖြိုးရေးအတွက် ကူညီလှူဒါန်းသည့်အလှူရှင်၏ စေတနာ သဒ္ဓါတရားအား လေးစားစွာဖြင့် ကျေးဇူးတင်ရှိကြောင်း ဤ "မှတ်တမ်းတင်ဂုဏ်ပြုလွှာ" ကို ဝမ်းမြောက်စွာ ချီးမြှင့်အပ်ပါသည်။

အမည်

နေရပ်

လှူဒါန်းမှု

လှူဒါန်းငွေ

(၃၁.၁၀.၂၀၁၈)

JUNE CEMENT INDUSTRY LTD.

ဘုန်းတော်ကြီးကျောင်းများအတွက် ကထိန်းသယ်နှင်းလှူဒါန်းခြင်း။
(၂,၄၅၀,၀၀၀/-)

ဘုန်းတော်ကြီးကျောင်းများအတွက် ဝါဆိုသင်္ကန်းလှူဒါန်းခြင်း
(၁,၂၀၀,၀၀၀/-)

(၃၀. ၃. ၂၀၁၇)

ကျိုက်မရောမြို့နယ် အခမဲ့ကုသိုလ်ဖြစ် ဆေးကုခန်း
လစဉ်အလှူငွေနှင့် မျက်စိခွဲစိတ်ခြင်း အလှူငွေ
(၂,၉၀၀,၀၀၀/-)

ကော့ပနော၊ ကော့ဒွန်း၊ ဝဲငဲ့ကျေးရွာများရှိ သက်ကြီးပုဂ္ဂိုလ်
(၉၀)ဦးအတွက် အလှူငွေ (၁,၈၀၀,၀၀၀/-)

ကျိုက်မရောမြို့နယ် မယ်ကရိကျေးရွာ ရေဘေးအတွက် လှူဒါန်းခြင်း
ရောသန့် (၂၀၉)ဗူး၊ ဆန် (၁၀) အိတ် (၄၄၉,၄၄၀/-)

(၅.၈.၂၀၁၈)

JUNE CEMENT INDUSTRY LTD.

ကျိုက်မရောမြို့နယ်၊ မယ်ကရီကျေးရွာ ရေဘေးအတွက် လှူဒါန်းခြင်း
ရေသန့် (၁၈၂၅)ဘူး ၊ ခေါက်ဆွဲခြောက် (၁၆၂၀) ထုပ်၊
ဆန် (၃) အိတ်၊ ဆီ (၃) ဘူး
(၃၄၁,၂၀၀/-)

APPENDIX 10 - Consultant Registration Certificate

REPUBLIC OF THE UNION OF MYANMAR
Ministry of Natural Resources and Environmental Conservation
CERTIFICATE FOR TRANSITIONAL CONSULTANT REGISTRATION
(ကြားကာလအကြံပေးလုပ်ကိုင်သူမှတ်ပုံတင်ခြင်းအထောက်အထားလက်မှတ်)

No. 0028 Date 15 MAY 2017

The Ministry of Natural Resources and Environmental Conservation, hereby, issues this certificate to the organization under Environmental Impact Assessment Procedure, Notification No. 616/2015.
(ပတ်ဝန်းကျင် ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း၊ အမိန့်ကြော်ငြာစာအမှတ်၊ ၅၁၆/၂၀၁၅ အရ သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာနသည် ဤအထောက်အထားလက်မှတ်ကို အဖွဲ့အစည်းအား ထုတ်ပေးလိုက်သည်။)

(a)	Name of Organization (အဖွဲ့အစည်းအမည်)	E Guard Environmental Services Co., Ltd.
(b)	Name of the representative in the organization (အဖွဲ့အစည်းကိုယ်စားလှယ်၏အမည်)	U Aye Thiha
(c)	Citizenship of the representative in the organization (အဖွဲ့အစည်းကိုယ်စားလှယ်၏နိုင်ငံသား)	Myanmar
(d)	Identity Card /Passport Number of the representative person in the organization (အဖွဲ့အစည်းကိုယ်စားလှယ်၏ မှတ်ပုံတင်/ နိုင်ငံကူးလက်မှတ် အမှတ်)	12/ MRK (Naing) 069784
(e)	Address of organization (ဆက်သွယ်ရန်လိပ်စာ)	No. 99, Mya Kan Thar Lane, Nyein Chan Yay Street, 10 Miles, Pyay Road, Saw Bwar Gyi Gone, Insein Township, Yangon. info@eguardservices.com, 09448001676
(f)	Type of Consultancy (အကြံပေးလုပ်ကိုင်မှုအမျိုးအစား)	Organization
(g)	Duration of validity (သက်တမ်းကုန်ဆုံးရက်)	31 March 2018

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The VALIDITY of this certificate is extended for one year from (1.4.2018) to (31.3.2019)
ဤလက်မှတ်သက်တမ်းကို (၁-၄-၂၀၁၈) ရက်နေ့မှ (၃၁-၃-၂၀၁၉) ရက်နေ့အထိ တစ်နှစ်သက်တမ်း တိုးမြှင့်ပေးသည်။
12.4.2018
For Director General
(Soe Naing, Director)
Environmental Conservation Department

Director General
Environmental Conservation Department
Ministry of Natural Resources and Environmental Conservation

REPUBLIC OF THE UNION OF MYANMAR

Ministry of Natural Resources and Environmental Conservation

CERTIFICATE FOR TRANSITIONAL CONSULTANT REGISTRATION

(ကြားကာလအကြံပေးလုပ်ကိုင်သူမှတ်ပုံတင်ခြင်းအထောက်အထားလက်မှတ်)

No. 10103 Date 15 JUL 2017

The Ministry of Natural Resources and Environmental Conservation, hereby, issues this certificate to the person under Environmental Impact Assessment Procedure, Notification No. 616/2015.

(ပတ်ဝန်းကျင် တိုင်ကိမ္မဆန်းစစ်ခြင်းဆိုင်ရာလုပ်ထုံးလုပ်နည်း၊ အမိန့်ကြော်ငြာစာအမှတ်၊ ၅၁၆/၂၀၁၅ အရ သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာနသည် ဤအထောက်အထားလက်မှတ်ကို လုပ်ကိုင်ရန်အား ထုတ်ပေးလိုက်သည်။)

(a)	Name of Consultant (အကြံပေးပုဂ္ဂိုလ်အမည်)	U Tin Aung Moe
(b)	Citizenship (နိုင်ငံသား)	Myanmar
(c)	Identity Card / Passport Number (မှတ်ပုံတင်/ နိုင်ငံကူးလက်မှတ် အမှတ်)	12/ Ma Ga Ta (Naing) 028014
(d)	Address (ဆက်သွယ်ရန်လိပ်စာ)	99, Mya Kan Thar Lane, Nyein Chan Yay Street, 10 Mile, Pyay Road, Saw Bwar Gyi Kone Ward, Insein Township, Yangon Northern District, Yangon. tinaungmoe@eguardservices.com , tinaungmoe1@gmail.com , 09 49321511 , 09 420330417
(e)	Organization (အဖွဲ့အစည်း)	E Guard Environmental Services Co., Ltd.
(f)	Type of Consultancy (အကြံပေးလုပ်ကိုင်မှုအမျိုးအစား)	Person
(g)	Duration of validity (သက်တမ်းကုန်ဆုံးရက်)	31 March 2018

Director General

Environmental Conservation Department

Ministry of Natural Resources and Environmental Conservation

Areas of Expertise Permitted
(ခွင့်ပြုသည့် ကျွမ်းကျင်မှုနယ်ပယ်များ)

1. Facilitation of Meeting

2. Land Use

3. Risk Assessment and Hazard Management

4. RS & GIS

REPUBLIC OF THE UNION OF MYANMAR

Ministry of Natural Resources and Environmental Conservation

CERTIFICATE FOR TRANSITIONAL CONSULTANT REGISTRATION

(ကြားကာလအကြံပေးလုပ်ကိုင်သူမှတ်ပုံတင်ခြင်းအထောက်အထားလက်မှတ်)

No. 10039 Date 15 JUL 2017

The Ministry of Natural Resources and Environmental Conservation, hereby, issues this certificate to the person under Environmental Impact Assessment Procedure, Notification No. 616/2015.

(ပတ်ဝန်းကျင် ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာလုပ်ထုံးလုပ်နည်း၊ အမိန့်ကြော်ငြာစာအမှတ်၊ ၅၁၆/၂၀၁၅ အရ သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာနသည် ဤအထောက်အထားလက်မှတ်ကို လူပုဂ္ဂိုလ်အားထုတ်ပေးလိုက်သည်။)

(a)	Name of Consultant (အကြံပေးပုဂ္ဂိုလ်အမည်)	U Aung Myint Myat
(b)	Citizenship (နိုင်ငံသား)	Myanmar
(c)	Identity Card / Passport Number (မှတ်ပုံတင်/ နိုင်ငံကူးလက်မှတ် အမှတ်)	9/ Ka Pa Ta (Naing) 214545
(d)	Address (ဆက်သွယ်ရန်လိပ်စာ)	Mudita lane, Loklatyae Quarter, Kyaukpadaung Township, Mandalay Region. aungmyintmyat@eguardservices.com , 09 797005168 , 09 794555989
(e)	Organization (အဖွဲ့အစည်း)	E Guard Environmental Services Co., Ltd.
(f)	Type of Consultancy (အကြံပေးလုပ်ကိုင်မှုအမျိုးအစား)	Person
(g)	Duration of validity (သက်တမ်းကုန်ဆုံးရက်)	31 March 2018

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The VALIDITY of this certificate is extended for one year from (1.4.2018) to (31.3.2019)
ဤလက်မှတ်အား (၀၁-၀၄-၂၀၁၈) ရက်နေ့မှ (၃၁.၃.၂၀၁၉) ရက်နေ့အထိ တစ်နှစ်သက်တမ်း တိုးမြှင့်သည်။
For Director General
(Soe Naing, Director)
Environmental Conservation Department

Director General
Environmental Conservation Department
Ministry of Natural Resources and Environmental Conservation

Areas of Expertise Permitted
(ခွင့်ပြုသည့် ကျွမ်းကျင်မှုနယ်ပယ်များ)

1. Forestry

THE REPUBLIC OF THE UNION OF MYANMAR

Ministry of Natural Resources and Environmental Conservation

Environmental Conservation Department

CERTIFICATE FOR TRANSITIONAL CONSULTANT REGISTRATION

(ကြားကာလအကြံပေးလုပ်ကိုင်သူမှတ်ပုံတင်ခြင်းအထောက်အထားလက်မှတ်)

No. 00223 Date 24 MAY 2019

The Ministry of Natural Resources and Environmental Conservation, hereby, issues this certificate to the person under Environmental Impact Assessment Procedure, Notification No. 616/2015.

(ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာလုပ်ထုံးလုပ်နည်း၊ အမိန့်ကြော်ငြာစာအမှတ်၊ ၆၁၆/၂၀၁၅ အရ သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာနသည် ဤအထောက်အထားလက်မှတ်ကို ထုတ်ပေးလိုက်သည်။)

(a)	Name of Consultant (အကြံပေးပုဂ္ဂိုလ်အမည်)	U Si Thu Min Naing
(b)	Citizenship (နိုင်ငံသား)	Myanmar
(c)	Identity Card / Passport Number (မှတ်ပုံတင်/ နိုင်ငံကူးလက်မှတ် အမှတ်)	9/AhMaZa (Naing) 032489
(d)	Address (ဆက်သွယ်ရန်လိပ်စာ)	No. 11, Airport Avenue Road, Yangon Airport Road, Saw Bwar Gyi Gone Quarter, Insein Township, Yangon, Myanmar. Mobile phone: 09 797005217, 09 43096583, E mail: sithuminnaing@eguardserveses.com
(e)	Organization (အဖွဲ့အစည်း)	E Guard Environmental Services Co., Ltd.
(f)	Type of Consultancy (အကြံပေးလုပ်ကိုင်မှုအမျိုးအစား)	Person
(g)	Duration of validity (သက်တမ်းကုန်ဆုံးရက်)	31 December 2019

Director General

Environmental Conservation Department

Ministry of Natural Resources and Environmental Conservation